

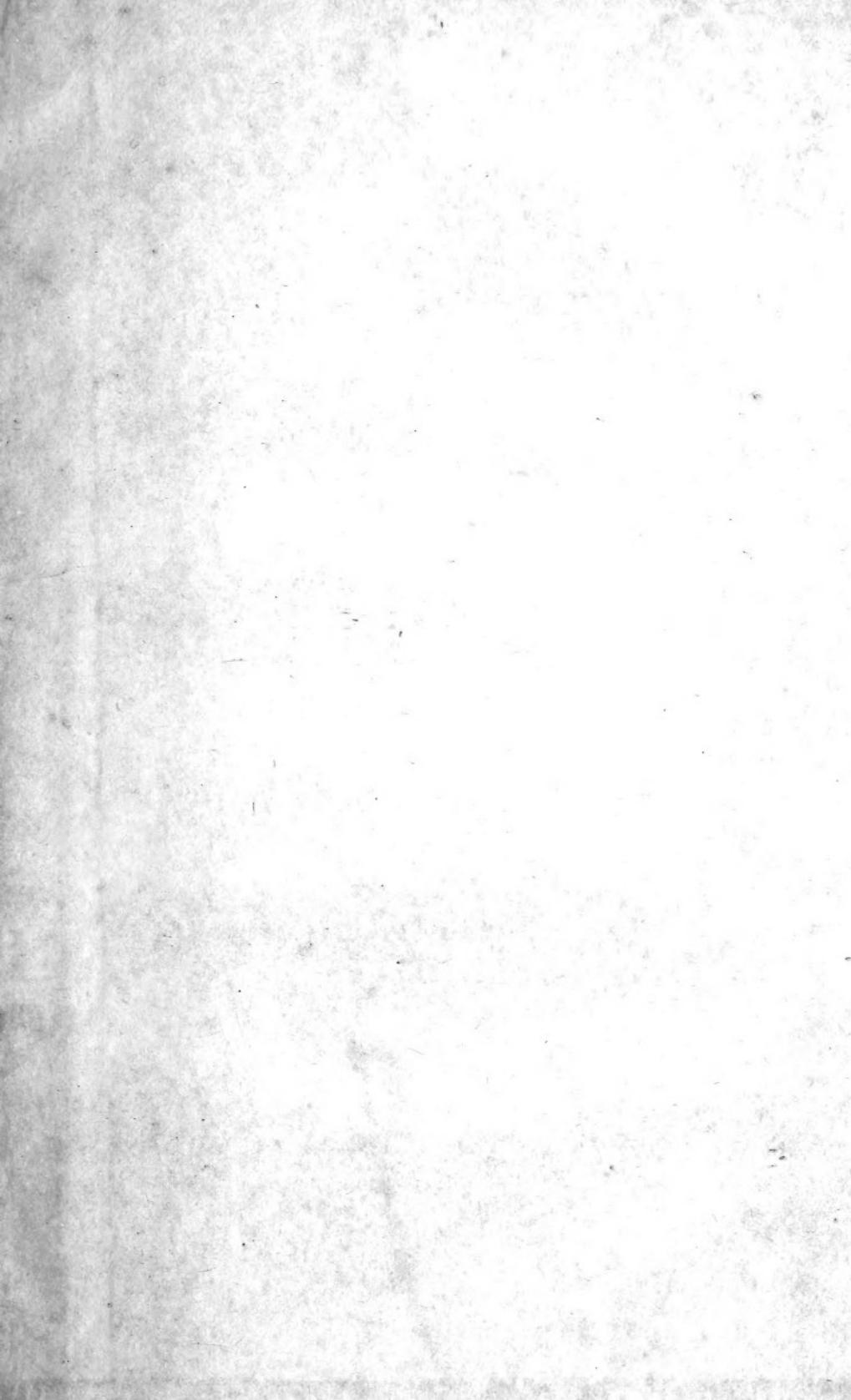


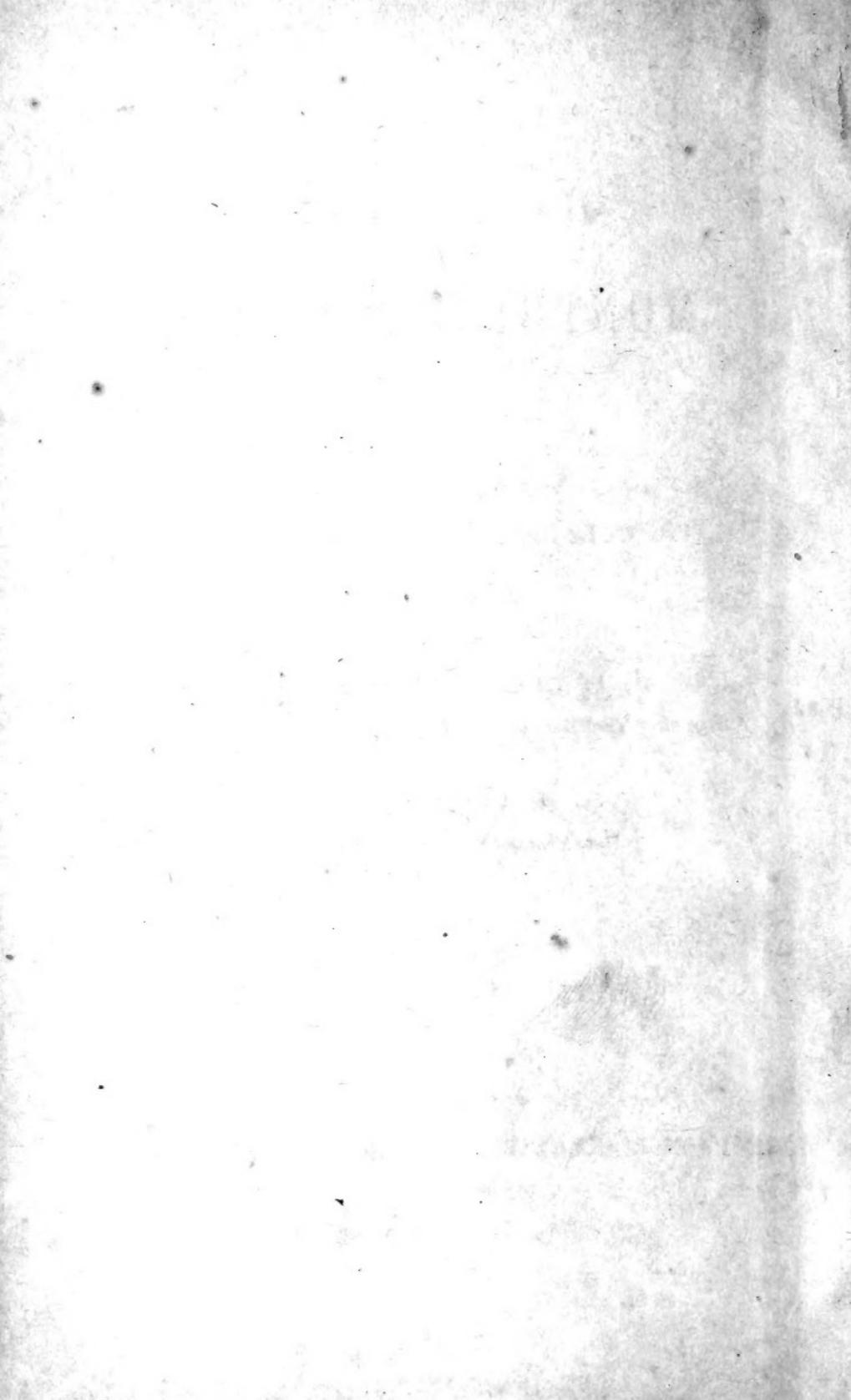
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THE  
GARDENER'S  
MONTHLY VOLUME.

V. 10

THE PEACH;  
ITS CULTURE, USES, AND HISTORY.

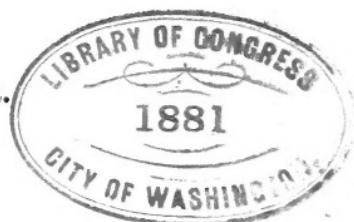
BY GEORGE W. JOHNSON,

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## THE PEACH.

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### HISTORY.

THE peach is mentioned by the earliest writers upon Natural History, and always under a name that points to Persia as the place of its origin. Thus, among the Greeks, Dioscorides (l. i. c. 164,) calls it *Persikon melon* (the Persian apple); but the *Persicon* or *Persikón* of Theophrastus (2 Hist. 3,) is, probably, the *Persea* of modern botanists, and, if so, widely differing from the peach.

This fruit was not known to the earliest Roman cultivators, for it is not mentioned by Cato in his work "*De Re Rustica*," though he enters minutely into the culture of other fruit trees; but, in addition to this negative evidence, we have the direct testimony of Pliny, who wrote his Natural History in the first century of the Christian era, and he there states that the peach had been introduced about thirty years. The first Roman writer who dwells upon the culture of the peach, is Columella, who wrote, prob-

ably about the latter half of the first century of the Christian era, and whose writings are commended by Pliny.\* The 10th book of Columella's "De re Rustica" is in verse, and "On the Culture of Gardens," in this, he speaks of the peach (v. 405,) as having been sent by the Persians to other nations, for the purpose of poisoning the inhabitants, but he speaks of it as a mere report, observing that in his time the fruit had not only lost the power of being hurtful, but yielded "ambrosial juices," though still retaining the name of the "Persian Apple." Pliny controverts the statement relative to the poisonous quality of the Persian peaches. Columella says, that the earliest were produced in Gaul, but that those introduced from Asia were slow in ripening. Palladius, who wrote, probably, about thirty years later than Columella, gives more full directions for the cultivation of

\* This settles with tolerable certainty the time when Columella wrote, which has been hitherto considered a matter of more uncertainty. Pliny died A.D. 113, aged 52 years, and it is fair to presume, that he composed his great work when about 40 years old, which would be in A.D. 101. The peach, he says, had then been introduced about thirty years, which marks its introduction to Rome in A.D. 70. Now, as Columella speaks of its Roman cultivation, he must have wrote after this year; and as his writings are mentioned by Pliny, he must have written before the composition of the latter's Natural History. Columella, therefore, lived between the years 70 and 100 of the Christian era.

this fruit, and says there were then three kinds, viz. *Duracina*, probably a hard-fleshed cling-stone variety; *Præcoqua Persica*, an early-ripe variety; and *Armenia*, which is our apricot, but classed by the ancients among the peaches. Besides these and the two mentioned by Columella (the Gallic and the Asiatic), Pliny mentions two others—*Supernatia*, produced in the Sabine district of Italy, and *Popularia*.

Pliny observes upon the history rather than upon the cultivation of peaches, remarking that by their Latin name, *Persica*, proof is given that they were first brought from Persia to Rome; adding that they are not a native of either Greece or Natolia. It was long, he says, before the peach was introduced at Rome, and it was not until after many trials that the Roman cultivators succeeded in establishing it in their gardens. In the Isle of Rhodes, which was its abiding place next to Egypt, the peach, in Pliny's time, was always unfruitful. (*Nat. Hist.* l. xv. c. 12 & 13.)

He goes on to observe that the *Duracina* was the best of all peaches, on account of the firmness of its flesh. The French and Asiatic peaches were so named from the regions whence they were imported. The peach, he says, was sold at the time of its first introduction for a Roman denier a piece, being equal to about eightpence of our money.

To our mind, the very name of *Popularia* is evidence that the peach soon became one of the com-

mon fruits of the Romans, and it is quite certain that it continues so, being cultivated as a standard throughout the length and breadth of the land.

The tenderness of the tree forbids the supposition that the Romans attempted its culture in Britain, nor is there any record justifying us to suppose that it was grown here before the reign of Henry the 8th (1509—1546). That monarch sent his gardener, who was a French priest, named Woolf, to travel on the continent, especially to gain improvement in the art of horticulture. He returned with the apricot and other fruits to the king's garden at Nonsuch, near Croydon, (Gough's Topography i. 133,) and among those may have been the peach; and thus much is certain, that Tusser, a contemporary,\* mentions of fruits in our English gardens, three kinds of peach—the white, the red, and the yellow-fleshed. It was not ripened well, however, probably, for Heresbach, a contemporary of Tusser, says, its hardier relative, the apricot, was much preferred, “being used as a great dainty among noblemen.” Dodoens, another contemporary, says that the white and the yellow-fleshed were identical.

Gerarde, who wrote a very few years subsequently, viz. in 1597, says that there were three or four kinds of peach—the white fleshed—the red fleshed—the

\* His “One Hundred Points of Good Husbandry” was published in 1557.

D'avant—and the yellow. He adds, “I have them all in my garden, with many other sorts.” (Herball, 1259.) The D'avant we may conclude was of French extraction. Johnson, in his edition of Gerarde's Herball, in 1633, says “There are divers sorts besides the four set forth by our author, and which may be had of my friend Mr. Miller, in Old-street, viz., two sorts of Nutmeg peaches; the Queen's peach; the Newington peach; the Grand Carnation; the Carnation; the Black; the Melocotone; the White; the Roman; the Alberza; the Island; and Peach de Troy. These are all good. He hath also of that kind of peach which some call *Nucipersica*, or Nectarins, these following kinds: the Roman Red (the best of fruits); the Bastard Red; the Little Dainty Green; the Yellow; the White; and the Russet, which is not so good as the rest.” He says that the D'avant peach was the *Persica Præcocia*. Great attention was now paid to this fruit, for Parkinson, whose *Paradisus* was published in 1629, enumerates twenty-one varieties, and says there were others without names; and six varieties of nectarines, which, he adds, “have been with us not many years.” The names of the peaches enumerated by Parkinson are as follows:—

1. The Great White.
2. The Small White.
3. Carnation.
4. Grand Carnation.
5. Red.
6. Russet.
7. Island.
8. Newington.
9. Yellow.
- 10.

St. James. 11. Melocotone. 12. Peach du Troas.  
 13. Queen's. 14. Roman. 15. Durasme or Spanish.  
 16. Black. 17. Alberza. 18. Almond Peach.  
 19. Man Peach. 20. Cherry Peach. 21. Nutmeg  
 Peach.

Mr. Ray, sixty years after Parkinson, gives a list of eighteen different sorts of peaches then in most esteem, the names of which are as follow :—

1. The White Nutmeg.
2. The Red Nutmeg.
3. The Troy Peach, so called from Troyes in Champagne.
4. The Isabella.
5. The Savoy.
6. The Bourdeux.
7. The Early Newington.
8. The Old Newington.
9. Violet Muscate.
10. Persicum.
11. Modanese.
12. Morello.
13. Rumbulliam.
14. Bellice.
15. Scarlet.
16. Royal.
17. Ricket.
18. Bloody Monsieur. (*Hist. Plantarum* ii. 1516.)

The number of the varieties continued to increase as years passed on ; for, in the “Complete Gardener” of London and Wise, published in 1699, 33 are enumerated ; in 1707, Mortimer names 47 ; Switzer, in his “Practical Fruit Gardener,” in 1724, only enumerates the following, according to the order in which they ripen their fruit, but they are evidently a select list :—

#### RIPE IN AUGUST.

The White Nutmeg.

- Red Nutmeg, or Forward Troy Peach.
- Passe Violet, or Double Troy Peach.

The Anne, so called in compliment to Mrs. Ann Dunch, of Pusey, in Berkshire, where it was raised.

- Royal George, “some time in England,” first raised by Mr. Oram, in Brompton House.
- Yellow Alberg.
- Minion, or Mignon : said to be so called by a King of France, with whom it was a favourite.
- Bourdin.
- White Magdalen.
- Magdalen Musque.
- Little Alberge.

#### RIPE IN SEPTEMBER.

The Montaubon.

- Chevereuse, or Goat Peach.
- Nobless ; came from France.
- Old Newington ; native of England.
- Elrouge ; so named from being the reverse of *Gourle*, a famous nurseryman at Hoddesden, in the time of Charles II., by whom it was raised.
- Rumbullion.
- Admirable.
- Red Magdalen, Persic, Bellegarde, Andillis, Pan and Narbonne.

#### RIPE IN OCTOBER.

The Nivet.

- Catherine.

It was about this time that forcing the peach began

to be practised ; for, in the above work, Switzer gives plans for hothouses for forcing fruit trees, especially the vine, including a description of the first which had been erected at Belvoir Castle by the Duke of Rutland. Miller's Gardener's Dictionary appeared about the same time, and gave some slight directions on the subject ; but the first separate treatise on the general culture of this fruit did not appear until 1768. It was a translation from the French, entitled "A Treatise on the Culture of Peach Trees," and contains much useful information. Next to this, in 1785 was published "A Treatise on the Management of Peach and Nectarine Trees, either in forcing-houses or walls," by Mr. Kyle, gardener to Baron Steward, of Moredun, near Edinburgh.

In 1786, Robert Browne, who filled a similar place in the establishment of Sir Harbord Harbord, of Gunton, in Norfolk, published one of the greatest of typographical curiosities, entitled "A Method to Preserve Peach and Nectarine Trees from Mildew." By having only thirty words on a page, and using very thick paper, a volume of 64 pp. is made, though it contains nothing but a list of subscribers, and a recipe how to make the common wash of soft soap and sulphur. In 1799, appeared, anonymously, a very excellent pamphlet, entitled "Letters to a Friend on the Pruning of Peach Trees and Vines ;" but a still more important work was issued from the Paris press

in 1814, by Mr. Mozard, entitled “Sur l’education du Pecher.”\*

France much preceded us in the culture of this fruit, for without reference to the peaches of Gaul mentioned by Columella, we shall find that from the very beginning of the 17th century, the age of Louis XIV., the commune of Montreuil, near Paris, has been celebrated for the culture and training of the peach ; and its industrious and laborious inhabitants are almost all exclusively devoted to the same pursuit, and with equal success. The fame of Montreuil attracted the attention of the famous La Quintinie, the founder and director of the fruit and kitchen garden at Versailles. La Quintinie, who was then considered the first trainer of trees in Europe, was astonished to hear that these simple villagers were successful, by following principles different from his own. He therefore engaged the son of Pepin, one of the most distinguished persons employed in training the peach in Montreuil, to leave his native village and come to Versailles, and train the trees in the royal gardens under his immediate inspection. It is unnecessary to mention the disputes that arose between young Pepin and his master, and we need only say that they

\* Watts, in his *Bibliotheca Britannica*, deceived by the similarity of the names in French, has included, in his list of works on the peach, the works of Noel and Reste on the Fisheries (des Peches.)

did not agree ; that the young Pepin returned to train his father's trees at Montreuil, and that the taille a la Quintinie continued to be prevalent everywhere. The nobles and courtiers liked their gardeners to train their trees a la Quintinie ; that all sensible gardeners refused to do so, and preferred leaving their places, or to be turned away, rather than submit to the absurd system of Quintinie. It was a true revolt of good sense against an absolute folly.

However, justice was at length done to the Montreuil method, and that of the director of the fruit garden of Louis XIV. was condemned, as alike contrary to nature and the interest of the cultivator. This equitable judgment, declared a century after the death of Quintinie, and confirmed by experience, can no longer be questioned. In short, the system of Quintinie was founded on this axiom, " defer enjoyment, in order to enjoy for a longer time ;" an axiom very just in many things, but altogether false in the culture of fruit trees. Quintinie cut in very much, in order to keep the trees growing without producing fruit, and in the hopes of thereby making them live much longer ; but it so happened, both to Quintinie, and to those who followed his principles, that trees which bore fruit naturally, after being two or three years planted, did not do so when treated a la Quintinie till after ten years, and then only in a very small quantity, and sometimes not at all ; while trees pruned

according to the Montreuil method, at the age of ten years, paid a hundred times their cost, and a hundred times the rent of the land they occupied.

It is not a little remarkable, that the pruning of peach trees was brought almost to perfection at Montreuil about the time of Louis XIV., people do not know very well how, and that it has remained in the same state till within the last dozen years. During that short period, it has been brought to perfection, as M. Lelieur has demonstrated in his *Pomone Francaise*. The pruning of peach trees in France has been reduced to three schools, viz. :—The school of Quintinie, of which the principle was to cut short, and to retard the production of fruit, and to lengthen the lives of the trees. Second, the school of Montreuil, of which the principle is to cut long, and the end to obtain abundance of fruit. Rogers Schabol is the most ardent of the numerous panegyrists of this mode. Third, the modern school, of which the principle is the same as that of the school of Montreuil, and the end to obtain trees full and regular in their branches, without these being confused or crossing each other, and well furnished with fruit. M. le Count Lelieur was the founder of the school in 1817, in collecting its scattered elements, which already existed in the practice of many cultivators, and in joining thereto the results of his own experience. The addition which Count Lelieur may be said to have

made to the Montreuil method, consists in filling up the two sides and the centre of the tree with branches. In the Montreuil method, there are two main branches allowed to every tree. These are, in general, trained in at an angle of 45 degs., and the side branches proceeding from them are laid in in such a manner as to cover great part of the wall. There is always, however, a space in the centre of the tree and also one on each side of it next the ground, which is left naked. Now, the grand object of Lelieur's method, or that of the modern school, is to fill up these naked spaces with bearing wood. This is to be effected by shortening the two main branches when young, so as to produce four branches ; and the side shoots of these being trained in with care, the wall will generally be found filled up. In doing this, when the lower branches of the tree are found weak, they are not trained in like the others, but allowed to grow right out for two or three months, during which time they acquire a degree of strength as great as that of the branches on the upper part of the tree. The methods of the three schools are evidently different modifications of what in England is called fan-training ; and there can be no doubt whatever, that the modern method, its object being to cover the wall completely with wood, is by far the best.

The origin of training the peach and the vine

against walls is thus given by Rogers Schabol. A cultivator of Montreuil having by chance thrown a peach against a wall with a south aspect, it grew up and produced fruit, which, from the shelter and heat of the wall, were found to be larger, more succulent, and of better flavour, than those produced on standard trees. This cultivator, seeing that the heat of the wall was favourable to the peach, fastened the shoots to it with nails and ties, and found the fruit still larger and better. In what year this cultivator lived is not stated; but he is considered as much more likely to be the inventor than Girardot, who lived in the time of Louis XIV., when training the peach had already been practised at Montreuil sufficiently long to produce young Pepin, who was the pupil of his father, already celebrated for training the peach. (*Annales d'Horticulture* xix.)

The deserved celebrity of Montreuil for peaches still continues; but although many have, no doubt, heard of Peches de Montreuil, Figues d'Argenteuil, Abricots de Triel, and Raisins de Fontainebleau, yet, perhaps, few have ever visited these places. It is generally known that French gardeners' delight is "specialities;" when they find any kind of culture particularly lucrative, or when the soil and air of one place is more congenial than another, that they almost invariably abandon a general trade or unfavourable situation, and direct all their energies to that one

favourite object. Not only is this the case with fruit, but equally so with flowers and plants. Montreuil-aux-Peches is about four miles east of Paris, and, together with the adjoining village of Bagnolet, has long been renowned for its peaches and nectarines ; so much so, that Paris and the country for 50 miles round is almost entirely supplied from these two places. It is, in fact, their staple article of trade, and one by no means inconsiderable, if report speaks truly of the amount, which is stated to be, on the average, 80,000 francs a year, independent of other fruits. An exact estimate of a produce so entirely regulated by the state of the weather is very difficult to ascertain. The year 1841 was unproductive, and the long continuance of wet and cold also materially checked the consumption : 1842, on the contrary, was exceedingly prolific, and the excessively hot weather in August augmented the demand in an equal ratio ; and it is said that the sale that season realised more than 120,000 francs. Large as this sum may at first sight appear, it will not, upon reflection, be found exaggerated, when the number and extent of gardens is taken into consideration. The markets and streets of Paris were literally glutted at the end of July ; and in August, fine fruit was sold at one penny, and very good at a halfpenny each. The gardens vary in size, from one-half to a whole acre, and are surrounded with walls about 8 ft. high, rising

amphitheatrically one above another to the top of the hills. They give the neighbourhood a picturesque appearance. The soil is generally a deep sandy loam, with here and there a mixture of blue clay, similar to that of Montmatre and Pere la Chaise. Most of the trees are old, yet their general appearance is healthy, which the cultivators attribute as much to their being worked upon almond stocks as to the suitability of the soil. Fan-shaped training is usually adopted; but another form, called "Espalier carre," is now coming into vogue. M. Lepere, of Montreuil, claims to be the originator of this system, which, however, is warmly disputed by some others. It appears to be little, if at all, different from the horizontal training which has for many years been practised in England. As the design of these gardeners is profit, it may readily be supposed that the varieties are chiefly confined to those which are most prolific, or produce the finest fruit in their different seasons of maturity. At almost every cultivator's are the Petite and Grosse Mignonne, Chevreuse hative, Galande, Magdeleine, Bourdine, Admirable, Belle de Paris, Royale, Pavie, and Teton de Venus, with a few nectarines, such as Violette hative, Musque, and Gross Violette. (*Gard. Chron.* 1842, 870.)

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## BOTANICAL CHARACTERS.

THE peach, *Persica vulgaris*, was distinguished by early botanists as *Amygdalus Persica*, and belongs to the Icosandria Monogynia class and order of the Linnæan system, and to the Rosaceæ of the natural arrangement. In its natural state the tree is under the middle size, with spreading branches; *Leaves* conduplicate when young, lanceolate, glabrous, and serrated; *Flowers* almost sessile, solitary or twin, rising from the scaly buds earlier than the leaves, with reddish calyxes, and pale or dark red corollas. *Fruit*, a fleshy drupe, with a velvety epicarp; roundish, generally pointed, with a longitudinal groove; the pulp, or sarcocarp, large, fleshy, succulent, usually white or yellowish, but sometimes reddish, and abounding with a grateful sweet-acid juice. The stone hard, having its shell, or putamen, wrinkled with irregular furrows, and its kernel bitter.

Its native country, both by the ancients and moderns, has been considered to be Persia, but it is also found wild in various parts of Asiatic Turkey. Pallas also found it in the southern districts of the Caucasus; and it has been truly observed, that from its frequency of occurrence, and its fruitfulness with but little cultivation between 30 and 40 degs. N. latitude,

we may conclude that within them is its most favourable habitat.

It endures our usual winters uninjured, and even succeeds as a standard in latitudes of N. America where the winters are much colder, and the summers hotter than with us. This is in conformity with the well-ascertained fact, that all deciduous trees suffer less from severe frost in winter, if their wood is perfectly matured by sufficiently warm summers, than where the frosts are less severe, but the summers also more temperate. Hence in the north of England young peaches are often injured by degrees of cold that do not affect others of similar age when exposed to them near London.

Where the mean temperature of the summer months is above 70 degs., or that of the warmest month above 75 degs., as at Rome and at New York, the *melting* varieties of this fruit are not so richly succulent as when grown against south walls in the more temperate summers of London and Paris. But, on the other hand, the *firm-fleshed* or *clingstone* varieties are preferred in America, though but little esteemed in England.

The peach is usually considered a short-lived tree, but we have no record of the age it is known to attain in its native state. When judiciously cultivated in England, it will continue vigorous and fruitful at the age of forty years.

The late Mr. Knight inclined to the opinion that the almond and peach are mere varieties of the same species, and asks, “if the peach be an originally distinct species, where could it have lain concealed from the Creation to the reign of Claudio Cæsar?” We do not incline to the opinion that the almond and peach are specifically the same; but if we did, we should not think that the opinion was strengthened by the negative fact alluded to by Mr. Knight, even if it were a fact, which it is not. We have seen that it was noticed by some of the earliest authorities extant, and though Cato does not mention the peach, yet he is equally silent regarding the almond. The evidence from Mr. Knight’s experiments, however, preponderate towards shewing that though the blossoms of the almond may be impregnated with pollen from either the peach or nectarine, yet, that plants raised from this hybridization are themselves incapable of producing fertile pollen, and therefore shewing that the offspring is a true mule; infertile, because engendered between two distinct species.

Although it is doubtful whether the almond and peach are specifically the same, there appears to be much less doubt as to the latter being parent of the nectarine.

In the Linnean Correspondence, it is stated, that a tree bought for a nectarine produced peaches; the next year it bore nectarines and peaches, and continued do-

ing so for twenty years after. P. Collinson informs Linnaeus that at Lord Wilmington's a tree produced both nectarines and peaches. Sir J. E. Smith, the editor, says, that several instances of this have occurred ; and that he was presented with a fruit half nectarine and half peach. It grew on a tree which usually bore nectarines and peaches ; but in two seasons, at some years' distance from each other, the same tree produced half a dozen of these combined fruits.\* Collinson mentions that he saw both fruits on the same tree close to each other ; and that a peach produced a nectarine from a stone, and not a peach, in his own garden. Without knowing the foregoing facts, Professor Chapman also stated, that in Virginia peach trees lived a number of years, and that when they were very old, he had often seen them bear nectarines. The fact is well known, he says, to all old natives of Virginia. (*Gard. Mag.* vi. 596.)

\* This is by no means an uncommon occurrence.—ED.

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## CHEMICAL COMPOSITION.

The peach was analyzed by M. Berard, both in an unripe and ripe state, and found composed of

	Unripe.	Ripe..
Chlorophylle .....	0.04	..
Colouring matter.....	..	0.10
Sugar .....	trace	16.48
Gum.....	4.10	5.12
Vegetable fibre.....	3.61	1.86
Albumen .....	0.76	0.17
Malic Acid .....	2.70	1.80
Lime .....	trace	trace
Water .....	89.39	74.87
	100.00	100.40

(*Thomson's Organic Chem. Vegetables*, 890.)

Hydrocyanic or Prussic acid is a component of the leaves, flowers, and kernel of the fruit.

## VARIETIES.\*

*Abricottee* (*Abricottee a Noyeau partage, Admirable Jaune, Grosse Jaune, Grosse Peche Jaune Tardive, D'Abricot, De Burai, D'Orange, Sandalie Hermaphrodite, Yellow Admirable*).—Leaves with reniform glands, flowers large, flesh melting, colour yellowish red, size large, quality indifferent, season beginning of October.

*Acton Scot*.—Leaves crenate, with globose glands,

\* Authorities, Hort. Soc. Catalogue; Lindley's Guide to the Orchard; Switzer, &c.

flowers large, pale rose, flesh melting, colour pale yellowish and red, middle-sized, quality first-rate, season end of August, not large but handsome, and a very excellent early peach. Raised by Mr. Knight in 1811, by impregnating the Noblesse with the Red Nutmeg.

*Admirable, Early*, (Admirable (English), L'Admirable (French), Belle de Vitry (of the Bon Jardiner).—Leaves crenate, with globose glands, flowers middle-sized, pale-red, fruit middle-sized, flesh melting, quality good.

*Admirable, Jaune*, see Abricotee.

*Admirable, Late* (Royal, La Royale, Peche Royale, Bourdine, Boudine, Boudin, Narbonne, French Bourdine, Teton de Venus, Belle Bausse of some, Belle Bauche *ib.*, Judd's Melting, Late Purple of some, Motteux's, Pourpree Tardive *ib.*).—Leaves with globose glands, flowers small, flesh melting, colour pale yellowish and red, size large, quality first-rate, season middle or end of September; one of the very best late peaches, and ought to be in every collection; is very proper for the peach-house to succeed the earlier sorts.

*Admirable, Late*, see Belle de Vitry (of Duhamel)

*Admirable, Yellow*, see Abricotee.

*Admirable, Scarlet*, (Dragon).

*Alberge* (of some), see Portugal.

*Alberge, Yellow*, (Purple Alberge, Red Alberge, Golden Mignonne, Gold Fleshed, Alberge Jaune, Peche Jaune).—Leaves crenate, with globose glands, flowers pale crimson, small, flesh melting, colour yellow and darkish red, middle-sized, quality indifferent, season end of August and beginning of September, flesh yellow. Bears as a standard at Brompton.

*Alberge Jaune*, see Rosanna.

*Almond Peach*.—Leaves serrated, glandless, flowers large and pink, flesh melting, colour pale yellowish and red, middle-sized, quality indifferent, season middle

of September. Raised by Mr. Knight, in 1815, from an almond, impregnated by a peach.

*American Clingstone*, see Braddick's North American.

*Anne*, see Early Anne.

*Ansley's, Colonel*, see Barrington.

*Avant*, see Grosse Mignonne

*Avant, Bear's Early*, see Bear's Early.

*Avant, Blanche*, see White Nutmeg.

*Avant, Early*, see Pourpree Hative.

*Avant, Early Purple*, see Grosse Mignonne.

*Avant, Peche Jaune*.

*Avant, Johnson's Purple*, see Grosse Mignonne.

*Avant, Johnson's Early Purple*, see *ib.*

*Avant, Peche de Troyes*, see White Nutmeg.

*Avant, Purple*, see Grosse Mignonne.

*Avant, Red*, see Red Nutmeg.

*Avant Rouge*, see Red Nutmeg.

*Avant Rouge*, (of some,) see Pourpree Hative.

*Avant, White*, see Early Anne.

*Barrington* (Buckingham Mignonne, Colonel Ansley's.)—Leaves with globose glands, flowers large, flesh melting, colour pale yellow and red, size large, quality first-rate, season middle of September, tree vigorous, and a good bearer, not subject to mildew. Raised about 40 years ago by Mr. Barrington, of Barwood, in Surrey.

*Bear's Early*, (Bear's Early Avant).

*Belle Bausse*, see Grosse Mignonne.

*Belle Bauce*, see *ib.*

*Belle Beaute*, see *ib.*

*Belle de Beaucaire*.—Leaves with globose glands, flowers small, flesh melting, colour pale green and darkish red, size large, quality first-rate, season beginning of September. Very like Bellegarde.

*Belle Chevreuse*, (Chevreuse, Early Chevreuse).—Leaves with reniform glands, flowers small, flesh

melting, colour pale yellow and red, size large, quality indifferent, season beginning of September. Not so good as the Chancellor, to which it is allied.

*Belle Tillemount.*

*Belle de Vitry, of Duhamel* (Late Admirable, Bellis, Admirable Tardive).—Leaves doubly serrated and glandless, flowers small and dull red, fruit middle-sized, flesh melting, greenish yellow, quality good. Ripe end of September. Requires a S. or S.E. wall.

*Belle de Vitry, (of the Bon Jardinier,) see Early Admirable.*

*Belle de Paris, see Malta.*

*Bellis, see Belle de Vitry of Duhamel.*

*Betterave, see Sanguinole*

*Bellegarde, (Galande, Noir de Montreuill, Violette Hative of the English, Violette Hative Grosse ib. Early Galande of some, Brentford Mignonne, Ronalds's Brentford Mignonne, French Royal George, Smooth-leaved Royal George of some, Large Violet, French Violette Hative of some English nurseries only, for the Peches Violettes of the French are Nectarines).—Leaves crenate, with globose glands, flowers small, reddish pink, flesh melting, colour pale green and dark red, size large, quality first-rate, season beginning and middle of September. A very handsome and excellent peach, forces well, succeeds Royal George and Grosse Mignonne, and keeps better than they do after being gathered.*

*Black, Swainson's (Swainson's). — Leaves with globose glands, flowers small, flesh melting, colour dark red, middle-sized, season beginning of September.*

*Blood Clingstone (Claret Clingstone). — Leaves serrated, glandless, flowers large, flesh clinging, colour dark red, middle-sized, quality indifferent, season October.*

*Bloody, see Sanguinole.*

*Boudin*, see Late Admirable.—Said to have been raised by a French gardener named Bourdine in the reign of Louis XIV.

*Boudine*, see *ib.* *Bourdine*, see *ib.*

*Bourdine, French*, see *ib.*

*Bourdine, Early*, of some, see Royal George.

*Braddick's North American* (*Braddick's*, *Braddick's American*, *Braddick's American Yellow*, *American Clingstone*).—Leaves crenate, with globose glands, flowers pale pink, small, flesh clinging, colour yellowish red, size large, quality bad, season middle and end of September, flesh yellow, firm, and coarse.

*Braddick's New York*.—Leaves with reniform glands, flowers small, flesh melting, colour pale green and red, middle-sized, quality indifferent, season beginning of September.

*Braddick's South American* (*South American*).

*Braddick's Red*.—Leaves serrated, glandless, flowers large, flesh melting, colour pale green and darkish red, size large, quality first-rate, season end of August and beginning of September. Resembling the Royal George.

*Braddick's Summer*.—Leaves with reniform glands, flowers small, flesh melting, colour pale green and red, size large, quality indifferent, season end of August.

*Burai*, see Abricotee.

*Burchell's Early*.      *Burlington Large Early*.

*Cambray*. — Leaves serrated, glandless, flowers large, flesh melting, colour pale green and red, size large, quality first-rate, season end of August. Resembles Malta.

*Cardinal* (*Le Cardinal*, *Cardinal de Furstenburgh*).—Leaves serrated, glandless, flowers large, flesh melting, colour red, size large, quality indifferent, season October, flesh red like beetroot; of little merit in this climate.

*Caroline, Kennedy's*.—Leaves with reniform glands,

flowers small, flesh clinging, colour yellow and red, middle-sized, quality indifferent, season end of September, flesh yellow.

*Catherine*.—Leaves crenate, with reniform glands, flowers small, reddish, flesh clinging, colour pale green and red, size large, quality first-rate, season end of September and beginning of October; one of the best late clinging peaches; requires a S. wall.

*Catherine, Green* (of the Americans).—Leaves with globose glands, flowers small, flesh melting, colour pale green and red, middle-sized, quality bad, season end of September.

*Catherine, Williams's*.—Leaves with reniform glands, flowers small, flesh clinging, colour pale green and red, size large, quality indifferent, season end of September and beginning of October; very like the Catherine.

*Catline*.—Leaves with globose glands, flowers small, flesh clinging, colour pale yellow and red, middle-sized, quality indifferent, season middle and end of September.

*Chancelliere* (Veritable Chancelliere, Grandes Fleurs).

*Chancellor* (Chancelliere var. of Duhamel, Noisette, Late Chancellor, Steward's Late Galande, Edgar's Late Melting).—Leaves crenate, with reniform glands, flowers reddish, small, flesh melting, colour pale yellow and red, size large, quality first-rate, season middle of September, flesh deeply tinged with red at the stone. Said to have been raised from a seed of the Chevreux by M. de Seguier, Chancellor of France.

*Chancellor, French*, see Royal George.

*Chevreuse*, see Belle Chevreuse.

*Chevreuse Early*, see Belle Chevreuse.

*Chevreuse d'Italie*.

*Chevreuse, Late* (Chevreuse Tardive, Pourpree).

*Chevreuse, Yellow*.—Leaves with globose glands, flowers small, flesh melting.

*Chinese Peach*, see Flat Peach of China.

*Claret Clingstone*, see Blood Clingstone.

*Congress*.—Leaves with reniform glands, flowers small, flesh clinging, colour pale yellow and red, size large, quality indifferent, season end of September; resembles the Catherine.

*Cothelstone Seedling*.

*Cooper's Early*.—Leaves with globose glands, flowers small, flesh clinging, colour pale yellow and red, middle-sized, quality bad, season beginning of September.

*Craavey's*.—Leaves with globose glands, flowers small, flesh melting, colour pale yellow and red, middle-sized, quality indifferent, season end of September.

*Dorsetshire*, see Nivette.

*Double Blossomed* (Pecher a Fleurs Doubles, Pecher Nain a Fleurs Doubles, Pecher a Fleurs Semi-doubles).—Leaves with reniform glands, flowers large, flesh melting, colour pale yellow and red, size small, season beginning of September. Worthless as regards its fruit.

*Double Montagne* (Montagne, Montauban).—Leaves serrated, glandless, flowers large, flesh white, melting, Apparently the same as Noblesse, yet it ripens some days earlier, and cannot like that have a Muscle plum stock.

*Double Swalsh* (Swalze or Swolze, Swalch, Dutch).—Leaves crenate, with reniform glands, flowers small, dark red, fruit middle sized, pale yellow and deep red, flesh melting, season early September. Brought to England by Lord Peterborough before 1729.

*Double Swalsh*, (of some,) see Royal George.

*Double de Troyes*, see Petite Mignonne.

*Downton, Early*.—Leaves crenate, globose glands, flowers large, pale rose, flesh melting, pale yellow and red, middle-sized, quality first-rate, season end of Au-

gust. Good, but scarcely equal to the Acton Scot, which it otherwise resembles. Raised by Mr. Knight in 1812.

*Dragon*, see Scarlet Admirable.

*Druselle*, see Sanguinolle.

*Dutch*, see Double Swalsh.

*Dunnington Beauty*.—Leaves serrated, glandless, flowers large, flesh melting, colour pale green and red, size large, quality first-rate, season end of August and beginning of September. Very like Noblesse.

*Early Anne* (Anne, White Avant of some).—Leaves doubly serrated, glandless, flowers large, nearly white, flesh melting, colour white, middle-sized, quality indifferent, season beginning and middle of August, handsome and tolerably well flavoured, but earliness is its chief recommendation. Raised a century and half since, and said to be named after the celebrated Anne Dunch, of Pudsey, Berks.

*Early French*, see Grosse Mignonne.

*Early May*, see *ib.*

*Early Purple*, see Veritable Pourpree Hative.

*Early Purple, Neil's*, see Grosse Mignonne.

*Early Purple of Kew*, see Royal Charlotte.

*Early Purple, True*, see Veritable Pourpree Hative.

*Early Red*.—Leaves with globose glands, flowers large, flesh melting, colour pale yellow and red, middle-sized, quality indifferent, season end of August.

*Early Sweetwater*.

*Early Vineyard*, see Grosse Mignonne.

*Edgar's Late Melting*, see Chancellor.

*Emperor of Russia* (Serrated, New Serrated, Unique, New Cut-leaved).—Leaves serrated, glandless, flowers small, flesh melting, colour pale yellow and dark red, size large, quality indifferent, season September, seems a shy bearer.

*Flat Peach of China*, (Chinese Peach, Pen To,

**Java Peach).**—Leaves crenate, with reniform glands, flowers large, fruit flat, about  $2\frac{1}{2}$  inches in diameter, but only  $\frac{3}{4}$  inch thick, flesh melting, yellow with beautiful crimson near the stone, size small, quality indifferent, season beginning or middle of September. May be forced and ripened very early in pots with greater facility than any other variety; on this account it merits some estimation, besides being an object of curiosity. First ripened in England by Mr. Braddick in 1819.

*Fleurs Doubles, Pecher a*, see Double Blossomed.

*Fleurs Semidoubles, Pecher a*, see Double Blossomed.

**Ford's Seedling.**—Leaves doubly serrated, glandless, flowers large, flesh melting, colour pale green and red, size large, quality first-rate, season end of August and beginning of September; resembles much the Noblesse, but is not its superior.

*Forster's*, see Grosse Mignonne.

*Forster's Early*, see *ib.*

*Galande*, see Bellegarde.

*Galande, Ronald's Early*, see *ib.*

*Galande, Ronald's Seedling*, see *ib.*

*Galande, Early*, see *ib.*

**Galande, Fuller's.**—Leaves with globose glands, flowers small.

*Galande, New.*

*Galande, Steward's Late*, see Chancellor.

**George the Fourth.**—Leaves large, acutely crenate, with globose glands, flowers small, dull red, flesh melting, colour pale yellow and red, size large, quality first-rate, season beginning of September. Raised by Mr. Gill, of New York, in 1819.

*Gloria, De.*

*Gold Fleshed*, see Yellow Alberge.

**Grandeville.**—Leaves serrated, glandless, flowers large.

*Golden Purple*.—Leaves with reniform glands, flowers small, flesh clinging, colour yellow and dark red, middle-sized, quality bad, season middle of September.

*Grande Monarque*.—Leaves with reniform glands, flowers small.

*Gross Jaune*, see Abricotree.

*Grosse Jaune Tardive*, see Abricotree.

*Grosse de Vitry*.

*Heath* (Fine Heath, Heath Clingstone, Red Heath).—Leaves with reniform glands, flowers small, flesh clinging, colour pale yellow and red, size large, quality first-rate, season October. In a hot season one of the very best late Clingstones, but the climate of this country is in general too cold for it.

*Hemskirke*.—Leaves doubly serrated, glandless, flowers pale rose, large, flesh melting, colour pale green and red, middle-sized, quality first-rate, season end of August. Raised at the Royal Gardens, Kensington, at the beginning of the present century.

*Holmes's*, see Twyford.

*Hoffmann's*, see Morrisania Pound.

*Hoffmann's Favourite*.—Leaves with reniform glands, flowers small, flesh melting, colour white and red, middle-sized, season beginning of September.

*Hoffmann's White*.—Leaves with reniform glands, flowers small, flesh melting, colour white and red, middle-sized, quality first-rate, season beginning or middle of September.

*Incomparable* (Pavie Admirable).—Leaves crenate, with reniform glands, flowers small, flesh clinging, colour pale yellow and red, size large, quality bad, season end of September and beginning of October. Larger than the Catherine, but not so good.

*Incomparable en Beaute*.—Leaves with globose glands, flowers small, flesh melting, colour pale yel-

low and greenish red, size large, quality indifferent, season middle of September.

*Incomparable, White Blossomed* (White Blossomed).—Leaves with reniform glands, flowers large, flesh melting, colour white, size large, quality indifferent, season end of August and beginning of September. Singular on account of its white blossoms and pale fruit.

*D'Ispahan* (De Perse).—Leaves serrated with reniform glands, flowers large, flesh melting, colour green and red, size small, quality bad, season middle of September.

*Italian*, see Malta.

*Java Peach*, see Flat Peach of China.

*Judd's Melting*, see Late Admirable.

*Kennedy's Carolina Clingstone*, see Kennedy's Lemon Clingstone.

*Kensington*, see Grosse Mignonne.

*Kew Seedling* (Kew Royal Seedling).—Leaves with globose glands, flowers small, flesh melting, colour pale yellow and dark red, middle-sized, quality indifferent, season beginning of September.

*Knapp Castle Seedling*.—Leaves serrated, glandless, flowers large, flesh melting, colour pale green and red, size large, quality first-rate, season end of August and beginning of September. Very like Noblesse.

*Knight's Early* (Knight's Early Seedling).—Leaves with globose glands, flowers large, flesh melting, colour pale green and dark red ; middle-sized, season middle of August. Resembles the Acton Scot, nearly as good.

*Langier*.

*Large Early*.

*Large Violet*, see Bellegarde.

*Late Purple* (Pourpree Tardive).—Leaves with reniform glands, flowers small, flesh melting, colour

pale green and dark red, size large, quality indifferent, season end of September; allied to the Chancellor.

*Late Purple* (of some), see Late Admirable.

*Lockyer's*, see Royal George.

*Lord Fauconberg's*, see Royal Charlotte.

*Lord Nelson's*, see Royal Charlotte.

*Lemon Clingstone*.—Leaves with reniform glands, flowers small, flesh clinging, colour yellow and red, size large, quality indifferent, season end of September, flesh yellow, like that of the two following; all three are esteemed in America for sweetmeats.

*Lemon Clingstone* (Hoyte's).—Leaves with globose glands, flowers small, flesh clinging, colour yellow and darkish red, size large, quality indifferent, season end of September.

*Lemon Clingstone, Kennedy's* (Kennedy's Carolina Clingstone, Pine Apple Clingstone, Pine Apple, Large Yellow Pine Apple, Red Mallacoton).—Leaves with reniform glands, flowers small, flesh clinging, colour yellow and red, size large, quality indifferent, season end of September.

*Limon.*

*Low's Large Melting*.—Leaves serrated, glandless, flowers small, flesh melting, colour pale yellow and greenish red, size large, quality indifferent, season beginning of September. Allied to the Royal George, larger but not so good.

*Madeleine*. — Leaves serrated, glandless, flowers small.

*Madeleine Blanche*, see White Magdalen.

*Madeleine de Bollwiller*.—Leaves serrated, glandless, flowers large, flesh melting, colour pale green and dark red, middle-sized, quality first-rate, season beginning or middle of September.

*Madeleine de Courson* (Red Magdalen of Miller, Madeleine Rouge, Rouge Paysanne, French Magdalen).—Leaves doubly serrated, glandless, flowers pale

blush, large, flesh melting, colour pale yellow and red, middle-sized, quality first-rate, season end of August and beginning of September, flesh with very little red at the stone ; the tree is a good bearer, but rather tender.

*Madeleine a Moyennes Fleurs*, see Royal Charlotte.

*Madeleine Rouge Tardive*, see *ib.*

*Madeleine a Petites Fleurs*, see *ib.* and Royal George.

*Madeleine Tardive*, see Royal Charlotte.

*Magdalen Red*, see Royal George.

*Magdalen Red*, (of Miller,) see Madeleine de Courson.

*Madeleine a Mamelon.*

*Magdalen White* (*Madeleine Blanche*, *Montagne Blanche*).—Leave doubly serrated, glandless, flowers pale rose, large, flesh melting, colour yellowish white and red, middle-sized, quality indifferent, season middle or end of August.

*Malta* (Italian, *Peché de Malte*, *Belle de Paris*, *Malte de Normandie*).—Leaves serrated, glandless, flowers pale, large, flesh melting, colour pale green and red, size large, quality first-rate, season end of August and beginning of September, hardy ; fruit keeps well after being gathered, and bears carriage ; deserves cultivation, and would probably succeed as a standard.

*Mammoth* (*Sachamoona*).

*Marlborough*, see *Grosse Mignonne*.

*Melecoton, Gros*, see *Pavie de Pompone*.

*Mellacoton, Red*, see *Kennedy's Lemon Clingstone*.

*Mellish's Favourite*, see *Noblesse*.

*Mignonne, American*. — Leaves with reniform glands, flowers small, flesh melting, colour pale yellow and red, size large, quality indifferent, season end of September ; near the Chancellor.

*Mignonne, Brentford*, see *Bellegarde*.

*Mignonne, Buckingham*, see *Barrington*.

*Mignonne, Cobb's.*—Leaves with globose glands.

*Mignonne, Dorsetshire.*—Leaves with reniform glands, flowers small, flesh melting, colour pale yellow and dark red, size large, quality indifferent, season end of September.

*Mignonne, Early*, see Petite Mignonne.

*Mignonne, Earliest.*—Leaves with globose glands, flowers small.

*Mignonne, Golden*, see Yellow Alberge.

*Mignonne, Grosse* (Grimwood's Royal George, Grimwood's New Royal George, Large French Mignonne, French Mignonne, Mignonne, Vineuse, Velontee, Velontee de Merlet, French Grosse Mignonne, Swiss Mignonne, Pourpree de Normandie, Pourpree Hative of some, Purple Hative, *ib.*, Early Purple Avant, Purple Avant, Avant, Early May, Early French, Early Vineyard, Padley's Early Purple, Neil's Early Purple, Neal's Early Purple, Johnson's Early Purple, Johnson's Purple Avant, Forster's, Forster's Early, Ronald's Early Galande, Ronald's Seedling Galande, Belle Bausse, Belle Bauche, Belle Beaute, Early Vineyard, Kensington, Royal Kensington, La Royale of some, Superb Royal, Vineuse de Fromentin, Transparent).—Leaves crenate, with globose glands, flowers pale rose and large, flesh melting, colour yellow and red, size large, quality first-rate, season end of August and early in September; good bearer and forces well; trees not subject to mildew.

*Mignonne, Griffin's*, see Royal George.

*Mignonne, Lockyer's*, see *ib.*

*Mignonne, Large Fruited.*—Leaves serrated, glandless, flowers large.

*Mignonne, Lord Fauconberg's*, see Royal Charlotte.

*Mignonne, Millet's*, see Royal George.

*Mignonne, Petite* (Small Mignonne, Early Mignonne, Mignonette, Double de Troyes, Peche de Troyes).—Leaves crenate, with reniform glands, flow-

ers small, flesh melting, colour pale yellow and red, size small, quality first-rate, season beginning or middle of August ; succeeds the Brown Nutmeg.

*Mignonne, Purple.*

*Mignonne, Ronald's Brentford*, see Bellegarde.

*Mignonne, Royal.*

*Mignonne, Woburn Early*.—Leaves serrated, glandless, flowers large.

*Mignonne, Yellow*.—Leaves with reniform glands, flowers small, flesh melting, colour pale green and pale red, size small, quality indifferent, season end of September, flesh dull yellow.

*Monstrous Pavie of Pomponne*, see Pavie de Pomponne.

*Morrisania Pound* (Morrison's Pound, Pound, Hoffman's).—Leaves with globose glands, flowers small, flesh melting, colour pale green and red, size large, quality first-rate, season middle or end of September. One of the best of the American varieties, yet its merit is not quite equal to that of the Late Admirable, the one it most resembles.

*Montagne*, see Double Montagne.

*Montagne Blanche*, see White Magdalen.

*Montauban*, see Double Montagne.

*Motteux's*, see Late Admirable.

*Mountaineer*.—Leaves with globose glands, flowers large, flesh melting, colour pale yellow and red, size large, quality first-rate, season beginning of September ; fruit sometimes partly smooth : raised between the Red Nutmeg peach and Violette Hative nectarine.

*Nain, Pecher* (Pecher Nain d'Orleans, Dwarf Orleans, Pot Peach).—Leaves serrated, glandless, flowers large, flesh melting, colour pale green and red.

*Nain a Fleurs Doubles*, see Double Blossomed.

*Narbonne*, see Late Admirable.

*Newington, Old* (Newington).—Leaves doubly ser-

rated, glandless, flowers pale pink, large, flesh clingstone, colour pale green and red, size large, quality first-rate, season beginning of September. Very good as a Clingstone peach.

*Newington Smith's* (Early Newington, Newington, Smith's Early Newington).—Leaves serrated, glandless, flowers pale pink and large, flesh clingstone, colour pale green and red, middle-sized, quality indifferent, season end of August and beginning of September.

*Newington* (of the Americans).—Leaves with globose glands, flowers small, flesh clingstone, colour pale yellow and dark red, size large, quality indifferent, season end of September and beginning of October.

*New, Cut-leaved*, see Emperor of Russia.

*New Serrated*, see *ib.*

*Nivette* (Nivette Velontee, Velontee Tardive, Dorsetshire).—Leaves crenate, with globose glands, flowers pale red and small, flesh melting, colour pale green and red, size large, quality first-rate, season middle of September; very like Late Admirable, but the tree is said to be more tender.

*Noblesse* (Mellish's Favourite, Vanguard, Lord Montague's Noblesse).—Leaves doubly serrated, without glands, flowers pale blush and large, flesh melting, colour pale green and red, size large, quality first-rate, season end of August and beginning of September; one of the very best, either for forcing or for the open wall. G. Lindley says that the Noblesse and Vanguard are not the same.

*Noblesse, Early.*

*Noblesse of Oatlands*.—Leaves serrated, glandless, flowers large.

*Noblesse, Pitmaston Seedling.*

*Noblesse, Seedling*, (New Noblesse). — Leaves doubly serrate, glandless, flowers large and pale pink, fruit middle-sized, flesh green and yellow, quality first-rate. Ripe early in September.

*Noire de Montreuil*, see Bellegarde.

*Noisette*, see Chancellor.

*Nutmeg, Early Yellow*.

*Nutmeg, Periods Early*.—Leaves with reniform glands, flowers small.

*Nutmeg, Red* (Brown Nutmeg, Early Red Nutmeg, Avant Rouge, Avant Peche de Troyes, Red Avant).—Leaves small, crenate, with reniform glands, flowers large, flesh melting, colour pale yellow and dark red, size small, quality indifferent, season end of July and beginning of August.

*Nutmeg, White* (Early White Nutmeg, Avant Blanche, White Avant).—Leaves small, serrated, glandless, flowers pale blush and large, flesh melting, colour white, size small, quality indifferent, season middle of July; has little merit except that of being the earliest.

*Orange, De*, see Abricotée.

*Ord's Peach*.—Leaves with reniform glands, flowers small, flesh melting, colour yellowish green and red, size large, quality indifferent, season beginning and middle of September; allied to the Chancellor, but not so good.

*Orleans, Dwarf*, see Pecher Nain.

*Orleans, Nainde*, see Pecher Nain.

*Padley's Early Purple*, see Grosse Mignonne.

*Pavie de Pompone* (Pavie de Pompone Grosse, Monstrous Pavie of Pompone, Gros Perseque Rouge, Gros Melecoton, Pavie Monstrueux, Pavie Rouge de Pompone, Pavie Rouge, Pavie Canui).—Leaves crenate, with reniform glands, flowers large, edges crumpled, flesh clinging, colour yellow and darkish red, size large, quality indifferent, season middle and end of October; will not ripen except in a warm season and good situation.

*Pavie de Jalagnier*.

*Pavie Jaune*.

*Peche-Jaune*, see Alberge Jaune, and Rosana.

*Peche Royale*, see Late Admirable.

*Peen To*, see Flat Peach of China.

*De Perse*, see Peche d'Ispahan.

*Persique* (Persequé, Gros Persequé, Persequé Allongée).—Leaves with reniform glands, flowers small, flesh clinging, colour yellow and red, size large, quality indifferent, season October. Requires a warm soil and situation.

*Persequé Rouge Gros*, see Pavie de Pompone.

*Pine Apple*, see Kennedy's Lemon Clingstone.

*Pine Apple, Large Yellow*, see *ib.*

*Pine Apple Clingstone*, see *ib.*

*Pound*, see Morrisania Pound.

*Portugal* (Alberge of some).—Leaves crenate, with reniform glands, flowers small, flesh clinging, colour pale yellow and red, size large, quality indifferent, season end of September and beginning of October. A white-fleshed Late Clingstone.

*Port Royal*.—Leaves serrated, glandless, flowers large.

*Pot Peach*, see Pecher Nain.

*Pourpree, Grosse.*

*Pourpree*, see Late Chevreuse.

*Pourpree Hative* (Pourpree Hative a Grandes Fleurs, Early Avant of some, Avant Rouge of some).—Leaves crenate, with reniform glands, flowers bright rose and large, flesh melting, colour pale yellow and red, middle-sized, quality first-rate, season middle and end of August.

*Pourpree Hative* (of some), see Grosse Mignonne.

*Pourpree Hative, Veritable* (Du Vin, Early Purple, True Early Purple).—Leaves with globose glands, flowers large. Probably nothing different from the Grosse Mignonne.

*La Pourpree* (Pourpree Tardive of the French.)

*Pourpree de Normandie*, see Grosse Mignonne.

*Pourpree Tardive*, see Late Purple.

*President*.—Leaves crenate, with globose glands, flowers deep red and small, flesh melting, colour pale yellowish green and red, size large, quality indifferent, season middle and end of September. Inferior to the late Admirable. An American peach, requiring a S. wall.

*Purple Hative* (of some), see Grosse Mignonne.

*Rambouillet* (Rumbullion).—Leaves crenate, flowers large, fruit middle-sized, flesh bright yellow, melting, quality good, ripe mid-September.

*Rare Ripe, Early Yellow* (Yellow Rare Ripe).—Leaves with reniform glands, flowers small, flesh melting, colour yellow and red, season end of August, flesh yellow.

*Rare Ripe, White Luscious*.—Leaves with reniform glands, flowers small, flesh melting, colour pale green and red, middle-sized, quality indifferent, season middle of September.

*Rickett's*, see Twyford.

*Ronde de Vallabregues*.

*Rosanna* (Petite Rosanne, Alberge Jaune, Peche-Jaune, Saint Laurent Jaune).—Leaves crenate, with reniform glands, flowers pale red and small, flesh melting, colour yellow and darkish red, middle-sized, quality indifferent, season mid-September, flesh yellow, bears as a standard in a good season and situation.

*Rouge, Paysanne*, see Madeleine de Courson.

*Royal*, see Late Admirable.

*La Royale*, see Late Admirable and Grosse Mignonne.

*Royal Charlotte* (Early Purple of Kew, Madeleine Rouge Tardive, Madeleine Rouge a Moyennes Fleurs, Madeleine a Petites Fleurs, Lord Nelson's, New Royal Charlotte, Grimwood's Royal Charlotte, Lord Fauconberg's, Lord Fauconberg's Mignonne).—Leaves doubly serrated, glandless, flowers small and pale

blush, flesh melting, colour palish green and darkish red, size large, quality first-rate, season beginning of September. An excellent sort, allied to the following; but distinguishable from it, as well as from other varieties, by its deeply and coarsely serrated leaves. Raised by R. Lowe, a nurseryman at Hampton Wick, in 1760.

*Royal George* (Millet's Mignonne, Red Magdalen, French Chancellor of some, Madeleine Rouge a Petites Fleurs, Lockyer's Mignonne, Griffin's Mignonne, Early Royal George, Early Bourdine of some, Double Swalsh of some, Superb).—Leaves serrated, glandless, flowers small, flesh melting, colour palish green and whitish red, season end of August and beginning of September. Excellent flavour, forces and bears well, but subject to mildew, as varieties with serrated leaves generally are.

*Royal George, French*, see Bellegarde.

*Royal George, Grimwood's*, see Grosse Mignonne.

*Royal George, Grimwood's New*, see *ib.*

*Royal George, Mignonne* (New Royal George Mignonne).—Leaves serrated, glandless; flowers dark red and small, flesh melting, colour palish yellow and red, season end of August and beginning of September; similar to Royal George. Raised by a friend of Mr. Ronald's, of Tooting, early in this century.

*Royal George, Smooth-leaved*, see Bellegarde.

*Royal Kensington*, see Grosse Mignonne.

*Royal Sovereign*, see *ib.*

*Rumbullion*, see Rambouillet.

*Sachamoonah*, see Mammoth.

*Saint Laurent Jaune*, see Rosanna.

*Saint Fagus*.

*Sundalie Hermaphrodite*, see Abricotree.

*Sanguinole* (Bloody, Sanguine or Blood, Betterave, Druselle).—Colour purple and red externally, that of

flesh like a beet. Used for preserves, as are also the other varieties of Sanguinole.

*Sanguinole a Chair Adherente*.—Leaves with reniform glands, flowers large, flesh clinging, colour darkish red, middle-sized, season end of October.

*Sanguinole, Melting*.—Leaves with reniform glands, flowers large, flesh melting, size large, quality indifferent, season end of September and beginning of October.

*Sanguinole, Pitmaston*.—Leaves with reniform glands, flowers large, flesh melting, colour dark red, size small, season end of September.

*Scarlet Anne*.—Leaves serrated, glandless, flowers large.

*Serrated*, see Emperor of Russia.

*South American*, see Braddick's South American.

*De Sernach*.—Leaves with reniform glands, flowers large, flesh melting, colour pale yellow and red, size large, season end of September.

*Spring-Grove*.—Leaves crenate, with globose glands, flowers pale blush and large, flesh melting, colour pale green and red, middle-sized, quality first-rate, season end of August and beginning of September; resembles the Acton Scot. Raised by Mr. Knight from Neill's Early Purple, by the pollen of the Red Nutmeg.

*Spring-Grove, Persian*.—Leaves serrated, glandless, flowers large, flesh melting, colour palish green and yellow and red, middle-sized, quality indifferent, season beginning of September.

*Sulhamstead*.—Leaves deeply serrated, glandless, flowers large, flesh melting, colour pale green and red, size large, quality first-rate, season end of August; very like the Noblesse. Raised at Mrs. Thoyte's, Sulhamstead House, near Reading, n 1815.

*Superb*, see Royal George.

*Superb Royal*, see Grosse Mignonne.

*Swainson's*, see Swainson's Black.

*Swalch*, see Double Swalsh.

*Swalze or Swolze*, see *ib.*

*Sweetwater* (Early Sweetwater).—Leaves serrated, glandless, flowers large, flesh melting, colour pale green and red, middle-sized, quality indifferent, season end of August,

*Teint-doux.*

*Teton de Venus*, see Late Admirable.

*Tonbridge*.—Leaves with globose glands, flowers small, flesh clinging, colour yellow and darkish red, middle-sized, quality indifferent, season end of September.

*Transparent*, see Grosse Mignonne.

*Transparente Ronde.*

*Troyes, Peche de*, see Petite Mignonne.

*Twyford* (Holmes's, Rickett's).—Leaves serrated, glandless, flowers large, flesh melting, colour pale green and red, size large, quality first-rate, season beginning of September; probably a seedling from Noblesse, which it very closely resembles.

*Unique*, see Emperor of Russia.

*Vanguard*, see Noblesse.

*Velontee de Merlet*, see *ib.*

*Velontee Tardive*, see Nivette.

*Vin, Du*, see Veritable Pourpree Hative.

*Vineuse*, see Grosse Mignonne.

*Vineuse de Fromentin*, see *ib.*

*Violette Hative*, (*of the English*), see Bellegarde.

*Violette Hative, French*, see *ib.*

*Violette Hative Grosse*, see *ib.*

*Washington Clingstone*.—Leaves with reniform glands, flowers small, flesh clinging, colour palish yellow and green and red, middle-sized, quality bad, season middle of September.

*Wellington.*

*White Blossomed*, see White Blossomed Incomparable.

*Williams's Early Purple* (Williams's Seedling).—Leaves serrated, glandless, flowers small, flesh melting, colour palish green and darkish red, size large, quality first-rate, season end of August. Scarcely different from Royal Charlotte.

*Witham's Seedling*.—Leaves serrated, glandless, flowers large.

#### SELECTIONS.

*For Pot Culture and Forcing in general*.—Grosse Mignonne, Noblesse, Royal George, and Bellegarde.

*For Walls in Scottish Highlands*.—Barrington, Bellegarde, Bourdine, Chancellor, Grosse Mignonne, Malta, Noblesse, Yellow Alberge.

*For Walls in N. of England and S. of Scotland*.—In addition to the foregoing, Catherine, Ford's Seedling, Late Admirable, Royal George, Smith's Newington.

*For Walls in S. and Midland England*.—In addition to the above, Early Anne and Madeline de Courson.

*For Standards*.—Rosanna and Yellow Alberge.

*The best Varieties* are Royal George, Bellegarde, Noblesse, Chancellor, Late Admirable, Catherine, Grosse Mignonne, Royal Charlotte and Barrington.

#### CHARACTERISTICS OF EXCELLENCE.

In England, the melting peaches, the flesh of which freely leave their stones, are much preferred; but in France, the Pavies or Clingstones, of which the flesh

is closely adherent to the stone, are much more esteemed. This is not mere caprice, for the climate of France produces the Pavies in greater perfection than does that of our country.

Whether melting or clingstone, to entitle it to rank as a first-class fruit, the skin should be thin, of a deep or bright red colour next the sun, and of a yellowish cast next the wall. The flesh should be very thick, firm, of a yellowish colour, full of juice, which should be high-flavoured ; and the stone small.

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### MODES OF PROPAGATION.

THE peach may be increased by seed, layers, budding, and grafting.

*By Seed.*—By this mode only varieties can be raised, as the seedlings never resemble their parent, but for the most part differ from it very widely.

Plant the stones in October or November, three inches deep, in a pot eight inches diameter, filled with light turfey soil from a rich meadow, and plunge the pot in the earth of a south border, sheltering in winter with litter or a frame. Move them into a viney, when forcing commences, in February. The plants will be up in March, and must be kept under glass to the end of the year. Allow as many laterals to remain as can have their leaves fully exposed to the light, and shorten them, whilst very young, to the

fourth or fifth leaf. Destroy the buds in the axillæ of these leaves as they appear. The laterals, near the top of the plant, when about seven feet high, must be shortened; but the buds are not to be touched. Change the pots three times during the summer, adding fresh turf each time. The plant will probably form blossom buds the same autumn, and these may be at once used for propagating the variety.

—(*Knight's Papers.*)

Hybridizing may be practised very successfully with the peach, by removing the stamens from the flowers of the female parent, and applying to their stigmas, by the aid of a camel's-hair pencil, pollen from the stamens of that which is wished to be the male parent. The *Acton Scot* and *Spring Grove* were thus obtained, the latter having for its male parent the Large French Mignon, and for its female parent the Small Red Nutmeg. The female parents were dwarfs grown in large pots; they were in vigorous health when impregnated, and only three peaches allowed to ripen on each tree. Each stone produced a different variety, of which the two above named were the best. In the above cross-breeding the principle was kept in sight, that the most excellent offspring is engendered between parents remotely related to each other.

*Layers.*—Mr. Knight states that peach and nectarine trees, particularly of those varieties which have

been recently obtained from seed, may be propagated readily by layers either of the summer or older wood, and even from cuttings, without artificial heat ; for such strike root freely. (*Knight's Papers*, 274.)

The layer, if the branch be not convenient for pegging down, may be obtained by circumposition ; that is, by passing it through the hole in the bottom of a small garden-pot, and filling this with light rich mould. This must be kept constantly moist ; and the pot and branch kept quite steady by tying to a firm stake. In any case the rooting is facilitated by cutting away a circle of bark just below the bud from whence the roots are wished to be emitted, and the branch should be layered at the close of July or very early in August.

*Grafting*.—Although we prefer budding to this mode of increasing the number of any desired variety, yet grafting is sometimes necessary. We shall take advantage of some useful directions relative to the practice from the pen of Mr. D. Cameron, gardener to Sir G. Cockburn, at Highbeach, Essex. The advice he gives concerning the stocks is also judicious and consonant with other directions we shall hereafter offer. He remarks that every gardener must have observed that the vigorous shoot made by the bud the first year, when cut down the second year to within six or eight inches of the stock, receives a severe check, and is very liable to disease. It frequently

happens that the future tree is spoiled in appearance by the weakness or unequal vigour of the side shoots, and partial decay of these, and of that part of the main stem which is above the stock. But, even under the most favourable circumstances, this mode of raising peach trees never produces handsome plants till the third year, and they seldom bear fruit till the fourth or fifth year.

As a quicker and better mode of raising trees of this kind, sow in autumn kernels of peaches, nectarines, or apricots, under the walls where they are to remain. They will make a vigorous shoot the following spring, and may either be budded in the August of the same year, or grafted the March of the year following. Grafting is the mode Mr. Cameron prefers, and the scion should have a quarter of an inch of two-years-old wood at its lower extremity. Scions so taken off succeed better than those taken indifferently from any part of the young wood. Cut the stock with a dovetail notch for the scion to rest on, and tie it on in the usual manner. Remove the buds of the scion in back and front, leaving two on each side and a leader; when these have grown six or eight inches, pinch off the extremities with the finger and thumb, by which means each shoot will throw out two others, and thus produce in autumn a fan-shaped tree, with ten branches. Generally they will bear two or three fruit the second year from the

graft, and a proportionably greater number the third year. The flavour of the fruit is superior to that from trees grafted on plum-stocks.

If budding be preferred to grafting, the shoot produced by the bud should be pinched after it has grown six or eight inches, and only five buds allowed to push ; the five shoots produced by these buds should themselves be shortened to five or six inches, and disbudded as they push, so as to produce a fan of ten shoots, as in the case of the grafted tree. If the wood so produced is properly ripened, it will hardly fail to produce blossoms the following year. (*Gard. Mag.* iii. 149.)

We highly approve of Mr. Cameron's remarks in the main, although we would prefer thus preparing the plants in the kitchen garden in a temporary situation, and removing them to their permanent station at the close of the second or third year. Our objections to this portion of the plan are, that the tree would form tap-roots, or at least roots inclined to ramble a considerable depth : they should not, moreover, be allowed to occupy principal stations whilst many temporary ones can be found, and which will equally suffice. Frequent transplanting whilst young, we hold to be the only legitimate procedure by which to obtain abundance of fibrous surface roots : these being obtained, well-ripened wood will follow as a matter of course.

The mode of stopping pursued by Mr. Campbell is judicious indeed; and could our nurserymen be persuaded to adopt a similar plan, it would be of immense benefit to the purchaser. In the nurseries, the peach and nectarine are propagated by budding in July. The head of the stock is cut off in the next February, and the gross stock of course puts forth a shoot strong enough for a whip handle. This, instead of being pinched off when about six or eight inches long, is suffered to ramble some five or six feet, in order to produce a plant of a specious character, termed "a strong maiden." Who can wonder that the large wounds which must occur in thus heading back should have a continual tendency to gum? Indeed, we have no hesitation in saying, that the seeds of premature decay are deposited at this very period; the evil being greater in proportion to the gross and showy character of the maiden plant.

A great objection to grafting is its being more uncertain than budding, owing to the excessive flow of sap or gum from the wound. Dr. Page, of Albany, in the United States, has obviated this by his mode of treatment. He says that the peach tree is of more rapid growth than any of the other American orchard trees, and frequently, in congenial soils, the first year from the seed, attains the height of six feet, with stems from one inch to one inch and a half diameter. The circulation, of course, must be very

active, and the sudden check from heading down such a tree, will in many cases destroy it. But should it live, the roots continuing in a state of activity, the scion is overflowing, as it were, by the sap ; that is, the sap flows so fast from the wounds, as to prevent the process of granulation, by which the scion is united to the stock. To graduate, then, the supply of sap to the wants of the scion, is the primary object ; and the measures necessary to secure this condition are just those which tend to preserve the life of the stock after heading down. In the middle of July, Dr. Page selected the scions from thirty trees, with four or five eyes, taking care to choose those which contained leaf-buds. The stocks chosen were moderately-growing instead of thrifty stocks, and were trees of the growth of that season from the seed. Before heading down, he passed a long sharp knife down entirely round the tree, and severed all the lateral roots at the distance of three or four inches from the trunk, according to its growth. This done, the trees were headed down at a point where the stem was just the size of the scion, or a little larger, as the scions were inserted a little on one side of the pith. The insertions were made in the ordinary way of cleft-grafting. The scions were then secured by a narrow strip of sheet lead, wound spirally over the whole length of the cleft, and a small ball of grafting clay put over the whole. Every scion inserted in

this way grew off finely. When heading down the stocks, he took care in every case to leave either one or two small shoots, some leaves, or several nascent buds, in order to continue all the functions of the tree until union had taken place between the scion and the stock. As soon as the buds of the scion began to put forth, all below upon the stock were pruned off. When the scions were taken from the trees, the leaves were all removed as in budding, leaving only a small portion of the footstalk. The clay and ligatures were removed in the autumn, when vegetation had ceased, and the wounds were all well closed. (*Albany Cultivator.*)

*Budding.*—Much of the future success of any tree depends upon the judicious choice of the bud from which it is raised. It should be taken from a healthy tree, that for some years has proved itself a good bearer of well-flavoured fruit. Do not take the bud from one of the most gross-growing shoots, but from one the wood of which is well ripened, and its buds close together. From these select the largest and plumpest. Such buds will not make very strong shoots the first year or two, but they will make healthy and good bearing trees. Bud the peach in the evening, or during cloudy weather, and in July or August; though we shall see presently that budding may be performed successfully in October and even November.

We would advise that the buds be selected from

towards the extremities of the main shoots; such will be found in general sound and of a fruitful tendency, although they may appear of a somewhat robust character.

It is a common practice to insert one bud only in each stock, in its side, and about six inches above the soil. There will be no harm, however, in inserting two; for an extra chance will be hereby secured. Moreover, in pursuance of the course recommended by Mr. Cameron, as previously quoted, the two buds opposite to each other being successful, will (if pinched or stopped according to his practice) produce two or three shoots each wherewith to form the principal arms of the future tree. By this mode, we confess, the centre of the tree for a season will appear unfurnished. We, however, prefer furnishing the centre of the peach from shoots of a secondary character, which, if the tree be healthy, will readily fill the centre from the side limbs or shoots.

After the budded trees have ripened their first year's shoots, they may be planted, either where they are to remain, or be trained in the nursery for two or more years until in a bearing state. Whichever plan is pursued, the first shoot, if it has grown unstopped, must be headed down in the March following, to produce lateral shoots, and a leader, to begin the fan-form training of the head, or according to any other mode that will be detailed in the sub-section "**TRAINING.**"

*Choice of Stocks.*—We prefer for all situations peach-stocks raised from stones sown either where the plants they produce may remain until after they are budded and had their first training ; or, which is better, sown beneath the wall against which the buds they have been innoculated with have their branches trained.

The experiments of Mr. W. Anderson, in the Botanical Garden at Chelsea (*Gard. Mag.* i. 384), and others of which we have a record, shew that the peach budded on an almond-stock is short-lived.

The Damask plum and the Greengage are often used as stocks for the peach, but we have found that, on an average, the trees are neither so healthy nor so fruitful as others budded on peach-stocks.

In Scotland, where the severity of the climate almost precludes any hope of cultivating the peach tree out of doors with regular success, Mr. M'Murtrie, gardener at Shuckborough Gardens, recommends, as the apricot succeeds very well in some situations, a few peach-buds to be inserted into those trees. In 1824, he inserted a quantity of buds, which took readily, and the next season made fine strong healthy wood ; and, in 1826 and 1827, they produced fruit far superior to that on the peach trees. (*Caled. Hort. Mem.* iv. 367.)

We have already stated that we prefer the peach stock to any other, but there are some good authori-

ties who use other stocks, and vary these according to the soil on which the trees are grown. Thus the Montreuil orchardists, near Paris, so famous for their peaches, employ almond-stocks on soils sandy or chalky, and plum-stocks where the soil is clayey. Mr. Knight, we think, inclined to the use of almond-stocks for the nectarine ; and adds, as a warning, that as they do not transplant well, they should be grown in pots.

Mr. J. Smith, gardener at Hopetown Gardens, N. B., has made the following observations upon this subject :—

The adaptation of stocks to soils has not been sufficiently studied in this country. In France, the peach is budded on almonds in dry situations ; while such as are destined for heavy loams are inserted on plums. It may also be noticed, that the French seldom venture peach trees on such clayey soils as we not unfrequently do.

Instead of budding the tree on the spot on which it is to grow, or transplanting it when, in technical phraseology, it is a maiden, that is one year old, we, in our impatience, have recourse to trees which have been trained in the nurseries. Such plants, by a rigorous application of the knife, are made to produce an abundance of showy wood, and, at the same time, are so circumscribed that they do not cover half as much wall as the French trees of the same age. The

vegetable energy, thus confined within a narrow space, is ready to burst forth in whatever irregular manner chance may determine. The principle members, which form the skeleton of the tree, are seldom sufficiently distinguished from the other branches. Taking their origin chiefly from the centre of the tree, they become too crowded, and they are further allowed to separate into an indefinite number of subdivisions. This defective arrangement, in general, and especially when combined with the foregoing circumstances, fails not to overthrow the equilibrium of the sap.

Again, there is a want of distinction between the subordinate members and the bearing shoots. The latter too frequently pass into the former, and then, in the confusion which follows, amputation either of larger or smaller branches becomes necessary. This pernicious operation is quite indispensable in those methods of pruning recommended by Mr. Knight and others, in which reversing and bending of the bearing shoots are prominent features. (*Cal. Hort. Mem.* iv. 155.)

Although Mr. Knight inclined to almond-stocks for the nectarine, he prefered peach-stocks for the peach, and gives the following directions for their raising. Instead of sowing the stones in pots as directed when varieties are the object, sow them in the border three inches deep, twelve inches apart, and in rows two feet asunder.

The plants will spring up in April, and in August and September will be of proper age and size to be budded about two inches from the ground. The nurseryman, therefore, will have the advantage of taking his buds from the trees whilst the fruit is upon them ; and he can, in consequence, easily guard against errors which much too frequently occur, and he may feel quite certain that none of his buds will break prematurely. Buds may be inserted in the early part of October ; and Mr. Knight introduced some with perfect success even in November. Late in the autumn he generally shortened the roots, which descend perpendicularly into the soil, by introducing a spade into the ground on two sides of each plant, but without moving it, or further disturbing its roots. Thus managed the buds shoot very freely, and with proper attention to preserve their fibrous roots, and to pack them properly, they may be sent to the most distant part of the island without danger of their being killed by their removal. Older trees, possibly, cannot be removed without danger of their failing ; but Mr. Knight transplanted a peach tree, in the autumn, of ten years old, which was growing upon its own roots, and was more than ten feet high ; and in the following spring, it emitted its blossoms as freely as those trees which had not been transplanted—its roots, however, were well preserved, and its branches properly retrenched. (*Knight's Papers*, 274.)

We may observe, as to the choice of stocks, that the main art of peach and nectarine cultivation does not lie here in quite so high a degree as some persons imagine. Not that all stocks are alike ; for much, very much, difference exists in this respect. It must be well known to many of our readers that peaches have been most frequently cultivated with the highest possible amount of success on the ordinary plum-stock ; and this merely by a proper adaptation of soils, together with extreme care in keeping down insects, and some other important points, of which more in their proper place.

Although it may appear somewhat egotistical, we may perhaps be pardoned for mentioning that we carried the Knightian medal at the July show, at Chiswick, this year, against all competitors, by peaches from a Bellegarde, budded on an ordinary plum-stock. The tree, moreover, has only been planted two years, being moved from the open wall, where it covered an area of 100 feet at the period of removal. Five of the peaches exhibited weighed  $52\frac{3}{4}$  ozs., thus averaging nearly 11 ozs. each. We question whether this weight, for five together, has ever been exceeded. The stock, as before observed, is the ordinary plum-stock.

It is the practice of the nurseries, we believe, to use what is termed the Mussell plum-stock for this purpose, at least for the common English peaches.

These are grown, or at least used to be, in great quantities in the lower part of Surrey, in what are called “stock nurseries,” purposely for the trade. The finer French peaches, however, in our younger days, were worked on a stock of more delicate habits, known by the name of the pear-plum-stock. This stock was a substitute for twice working, which was in somewhat general practice about fifty or sixty years since. The course then pursued was to bud the common plum-stocks with some gross or robust kind of peach, as the Royal George, and then to bud the delicate kinds of French peaches on this stronger kind.

Whatever kind of stock be used, we would systematically transplant them twice before they were budded, and once afterwards. We hold that abundance of surface roots on undug borders are the best guarantee of permanent success. Indeed, we conceive the essential difference between the employment of common plum-stocks and those of the almond, or from the peach kernel, lies in the different character of the roots, together with the comparative ratio at which the ascending sap is furnished—the plum being more inclined to tap roots; and unless somewhat tamed by a preparatory course, liable to surcharge the system of the tree with fluids. It should not be forgotten, moreover, that the deeper root of the plum creates a tendency to late growth in the

peach, which, we need scarcely say, is of a watery and immature character. We will offer more observations on this subject under the head “border-making.”

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## SOIL AND MANURES.

THERE are two most essential points to be attended to in the borders where the peach is grown; so essential, indeed, that, if not sufficiently provided for, the trees grown upon them will never be productive, for they will have gross ill-ripened shoots, and diseased, blistered leaves. The essential points alluded to are complete drainage, and avoiding the employment of rich animal and vegetable manures.

The following directions embrace both a good system of drainage, and the preparation of a soil most suitable for this tree.

Nine inches of flints, stones, or brickbats, with under-drains to carry off the water, will accomplish the drainage of a peach border; on this lay 18 inches of mellow loam, of a turfey nature, from a dry healthy old pasture, without any manure, and the border is complete. This arrangement, like all others in good gardening, is without mystery, and when carried out, inexpensive in most places. One of the most important points in peach-growing is to get bearing-wood. The border has a great deal to do with this, for when

manure is liberally supplied to the border, or when the roots have a superabundance of moisture, caused by imperfect drainage, the shoots under such circumstances are not of that quality which gardeners distinguish as short well-ripened bearing-wood. (*Gard. Chron.* 1845, 512.)

The most important affair is to select a good loam ; and although some of our continental neighbours seem to prefer a light soil, the majority of good English peach-growers like a sound loam. The term sound loam is, we acknowledge, of a somewhat indefinite character, and it is not very easy to convey a just notion of what we mean by it.

Loams differ much in colour as well as texture ; we do not, however, conceive that colour is of very great importance, although we must confess that we prefer a bright loam of a yellowish cast. We like it to be slightly adhesive, not however clayey. The more the clayey principle predominates, the shallower the border should be ; and, as a general principle, we advocate rather shallow borders ; two feet we think amply sufficient, especially in the northern counties. We have grown first-rate peaches and nectarines on borders not more than sixteen inches in depth, but then there was no cropping carried on, which could by any means interfere with the surface roots ; and top-dressing was resorted to, as indeed it must be in such cases during the heat of the summer. This

depth, then, we would recommend especially for our northern counties ; for, after all, ripening the wood is the grand leading principle, without which all other appliances will be neutralised. Hot and dry summers are the exception, not the rule, in England ; and the above depth we think provides best for the average of seasons.

It is comparatively easy to apply water when needed ; not so easy to remove it in soils of great depth and in rainy seasons. There is no great difficulty in applying three or four barrowsfull of manure as top-dressing, during unusually hot periods ; much difficulty, however, exists in checking a tendency to late and immature growths, when trees are planted in deep and rich soils—especially during a damp and dark summer, closed by a showery autumn. A good sound loam, therefore, little more than half a yard in depth, will, we think, best suit the majority of cases. As, however, trees are very differently circumstanced when planted inside the peach-house, we shall make our remarks more serviceable by detailing the style of border best adapted for the forcing-house, as also that for the out-doors wall. Hot walls will also require a separate notice, and we proceed to offer practical points on each respectively.

*Mode of Preparing Borders out of doors.*—To determine on a proper level is the most important principle from which to start. If the ground is in a low

district, and naturally of an adhesive character, one half the volume of the border should be above the ordinary ground level. The most perfect drainage in such cases must precede all other operations ; without this the whole must ultimately prove a failure. In ordinary cases, and where no particular suspicion rests as to the retention of water, one bold main drain, communicating with the porous substratum (and placed one-half of its depth below the level of that body), will suffice. If, however, the ground is naturally damp, cross drains must be had recourse to ; their frequency corresponding with the amount of water to be drawn. In general, such cross drains may be placed about fifteen or twenty feet apart.

Much has been written about impervious bottoms of concrete, &c. ; we, however, are decidedly opposed to them. They are, at the best, doubtful on the score of principle, and decidedly objectionable on the score of expense. They moreover serve to render a matter, perfectly simple in itself, complicated ; and may serve to deter many persons from attempting the cultivation of this luscious fruit, which is certainly within reach of all who can command a wall, and can bestow a little attention occasionally.

The under-drains being established, the next thing is to place a considerable body of any broken, porous, and imperishable material over such drainage. Broken bricks, stones, or scoriaceous matter is the sort of

thing ; and this should, in ordinary cases, be laid at least eight inches deep ; in extraordinary cases of wetness, or in our more northern counties, the deeper the better. Such having been spread to a fair and even surface, means must be taken to prevent the soil from entering the surface. We find nothing superior to clean-riddled cinders, sweeping them into every crevice, and working them to a very even surface, over which a roller may be finally passed.

Our practice is to place a layer of thick turves immediately on this, with the grass side downwards. These turves should be from a very old pasture if possible, and possess a vast amount of fibrous matter. Our loam being at hand, we proceed by throwing on alternately a layer of loam and a layer of fresh stable-door litter ; introducing the latter in very thin portions, shaking it out with a fork. We also occasionally sprinkle in a few of the fallen oak or beech leaves recently raked from the Park ; our object being to keep the soil elastic for a long period, and rather to add organic matter than stimulating manures.

These operations should always be performed during a dry period ; and those who intend doing full justice to a peach border, should have every thing in readiness by the end of August, in order to take choice of weather between that period and the planting time.

No loams can ever be relied on if handled in a wet state ; such a proceeding will nullify the best laid

plans. We may here add, that we highly approve of a sprinkling of bones, crushed to what is termed in the market, "half-inch bone." Such many be mixed with crushed charcoal, and introduced rather liberally; we would say, one part of the bone to three parts of the charcoal, and as much of the two as would cover the face of the border three inches in thickness. Where such is introduced, however, the border should be made three or four inches deeper.

*Mode of Preparing Borders in-doors.*—We need say little on this head ; the principal difference will be in point of depth. Peaches and nectarines in-doors have to endure a greater amount of ground heat, as well as atmospheric, on the average ; a much greater demand therefore exists on the system of the tree. We also advise a more liberal application of manure ; and good stable manure, in a fresh state, may be introduced in the proportion of one part to six ; besides a small proportion of the stable litter, as recommended for the out-door borders. The loam, moreover, should, if possible, be somewhat sounder still ; avoiding, however, every thing of a clayey character. We make our in-door borders a yard in depth, taking care that the bottom is rendered perfectly safe from the effects of stagnant waters. The bone and charcoal may be introduced here as in the out-door borders, and the filling-in accomplished in a similar way.

*Mode of Preparing Borders for Flued Walls.—*

Here again, as the trees will be subjected to a somewhat greater amount of heat in the aggregate, we would make the border a little deeper than for ordinary walls. The whole of the process here, in fact, may be exactly intermediate between the course recommended for the house border and that of the open wall.

Before closing with the subject of border-making, it will be well to observe, that the more turf the loam contains the better ; and that from very old rest-land is by all means to be preferred. It may be dug or cut from two to six inches deep, according to the designs of the proprietor, and one rough chopping will suffice ; it must by no means be broken fine. Lumps of solid turf, in masses, four or five inches in thickness, should prevail through the whole mass.

If a soil is a friable loam, but deficient in decomposing organic matter, the best compost which can be employed is a mixture of bone-dust and decayed leaves, in the proportions of two parts of the latter to one of the former.

#### AS A STANDARD.

*The Hardy Morton Peach* was raised from a stone of a fruit which was gathered in the garden of J. Morton, Esq., Rehoboth, near Dublin. Throughout its growth it was exposed to all the vicissitudes of our climate, and was the hardiest variety we were ac-

quainted with. It was planted in an open border which ranges north-west and south-east, for the purpose of training it as an espalier, hoping that its initiation to our climate would render its habits more suited to a productive growth than those which have been fostered in houses or against walls. The result realised those hopes ; its growth was too vigorous to bear the restraint of an espalier form, and therefore, in preference to employing that usually prejudicial, and, at least, temporary remedy of over-luxuriance, reducing the number of the roots, the centre branch was trained as a standard, and the two side limbs as an espalier. It grew most luxuriantly, and the second year it bore thirty-five peaches, five of which were on the standard branch, and scarcely at all later in their ripening than those on the trained branches. The tree stood on a declivity sloping to the south.

Having left the house in the garden of which this tree was grown, it was neglected and died ; but we believe that buds were taken from it, and, if so, it will be found the hardiest of our varieties. The outer skin of the fruit was very unusually thick.

The Rosanna, and probably some of our other early-ripening varieties, will ripen their fruit as standards, if grown in a favourable situation, such as on a soil sloping to the south, or south-east, and sheltered from the other colder points of the compass, as well as from the westerly winds.

If so planted on a well-drained soil, and allowed to grow unchecked, it would require little other pruning than removing such branches as incommoded others. We would remark, however, that, if an attempt be made to carry out this mode of cultivation, the soil should be a fresh maiden loam, and by no means deep. In the northern counties we would also elevate the site of the tree a foot above the ordinary level, enclosing the soil by turves or by stones. Richness of soil would, in this case, never produce short-jointed wood, without obtaining which all the labour bestowed would be fruitless. Whatever mode of training might be adopted, the shoots should be kept thinly pruned, and liberally disbudded.

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## WALL CULTURE.

*The Border* for peach trees need not have more than a foot's depth of soil, nor be wider than six feet; but 18 inches deep and eight feet wide is the best allowance. Whatever be the dimensions, good drainage, as urged in a previous section, is of absolute importance.

Mr. A. Cramb, gardener at Heywood House, Wiltshire, is in favour of the smaller dimensions, observ-

ing that a border of six feet wide, and one foot deep, is sufficient to support trees luxuriantly. Those who grow peach trees in pots have an evidence of this from the small quantity of soil which is required to maintain them in vigour. When manure is wanted, it can be given in a liquid form, and in such quantities as the cultivator may think proper. A breadth of border is preferable to a depth of soil. The roots in the former situation will ramify under the influence of solar heat, and the nutritious gases of the atmosphere, which give flavour to the fruit and stability to the wood. As a covering for shallow borders, decayed tan is a very suitable material. It always presents a clean appearance, and is a great absorber of heat. (*Gard. Journ.* 1846, 60.)

It ought to be kept in mind that if the border is very shallow no cropping must be permitted over the roots, or at least none that requires a spade. A very sound loam also should be used for making the border, or the trees will be liable to suffer in hot periods. Mr. Cramb's advice is very good on the whole: we do not, however, like the old tan, unless it is removed when getting much decayed. We would rather cover with rotten farm-yard manure, which is never too stimulating on the surface, providing nothing but sound loam has been used in making the border, and that the border is free from the lodgment of water.

The drainage should be effected by draining tiles;

and we quite agree with Mr. Marnock in deprecating the practice of paving or concreting between the border-soil and the subsoil. Wherever the bottom is so constructed as to resist the passage of moisture, either upwards or downwards, we think the surface, in like manner, ought to be shielded from the falling rains. We had almost said that nothing could be more unphilosophical than to lay the border earth on an impervious stone floor, which must of necessity retain every drop of rain water that falls upon it. It is true it may filter towards the front and escape ; but what an excess of moisture there must continually be towards the lower part of the border ; certainly quite enough, for at least nine months in the year, to keep six or nine inches of the lower portion of the border completely saturated with wet ; and more than enough to rot half the roots of the trees, which annually send their roots downwards. (*Gard. Journ.* 1846, 501.)

These remarks of Mr. Marnock are indeed most judicious, and the idea of making impervious bottoms cannot, in our opinion, be too much repudiated. It does, indeed, appear strange, that whilst the agriculturist is so anxious to remove the hard pan from beneath his soil, which exists in some localities, and whilst the benefits of a thorough aration by subsoiling or otherwise are generally recognised, that gardeners

should be found backing so disputable a point. It does, indeed, to us, appear a retrograde course; for surely the roots may be kept up, and the passage of the water facilitated, without recourse to such expensive and doubtful processes.

In establishing a peach border, in which, as before observed, draining is of paramount importance, providing waters lodge, the character of both soil and subsoil must be taken into consideration. We have known situations where no drainage whatever is necessary. Indeed, such is the case with the borders under our own management. Our trees are planted on platforms composed of broken bricks or stone, which reach about two yards from the centre of the tree each way. The subsoil beneath is of common red sand, several feet in depth, and quite dry. We have grown first-rate peaches on such borders for nearly twenty years without a single drain. The majority of soils, however, require some drainage, and for this purpose we would recommend a deep and capacious receiving drain along the front of the border, and parallel with the wall, and cross drains running rather diagonally into the main. The frequency of the latter must be regulated by the amount of suspicion as to wet. These drains must be well secured at the top, and should carry a superstratum of broken and imperishable material, from three to six inches thick at least, in order to secure the surface from the

percolations of the superincumbent border. We lay a layer of thick turves on this, merely sweeping some fine gravel or cinders in the interstices of the turves.

*Walls.*—These must not be less than nine inches thick, otherwise they will cool so quickly as not to forward the ripening of the fruit and wood so rapidly as is desirable. They are quite as efficient in this respect, if not more so, when built nine inches wide, but hollow. They should have a far projecting coping on the top, for this not only checks the radiation of heat from the wall, but is a protection from strong wind and heavy rains, which are especially liable to injure the blossoms. Moreover, they facilitate the use of netting, &c., as will be more fully particularized in the section devoted to “Shelters.”

Another most important point is the quarter of the compass the wall should face. A south-east aspect is decidedly preferable to a south-west one for peaches. If, however, the border is not too wet, and if the trees are properly trained, they ought to succeed very well on a south-west aspect. The heavy rains to which they are then exposed are injurious when they occur in the blossoming season ; but if the border is sufficiently permeable, the rain, always comparatively warm from that quarter, is beneficial, and far preferable to artificial watering. The vigour of shoots produced on this aspect is generally such as to require them to be trained in a direction nearly horizontal ; and when so

trained, an abundance of large fruit is generally the consequence ; but if allowed to grow upright, or nearly so, few or no fruit is produced. (*Gard. Chron.* 1841, 689.)

We would here remark that, although in the southern counties the peach will ripen tolerably well on a south-east aspect, yet north of Birmingham, which is, we believe, near the centre of England, south aspects must be had recourse to in order to ensure success. Indeed, when we get as far north as the county of Northumberland, and on the borders, flued walls are considered necessary. In the counties of Cheshire and Lancashire the peach is produced in pretty good perfection without the aid of flued walls, in most seasons. Several walls of this character are, however, to be found in those counties, and the superiority of such is manifest.

It is well to have, even in some of the northern counties, a late kind or two to carry out the peach in long succession ; such as the Late Admirable amongst the peaches, and the Elrige or Newington amongst the nectarines. These, when successful, will produce fruit, which will be most acceptable, up to the middle of October. For such, a south-east aspect would be admirable. The soil, however, should not be deep, or the trees will run too much to wood, which will defeat the end in view.

*Flued Walls.*—To advance the ripening of peaches

during ungenial summers in any part of England, and to enable them to be ripened at all in the open air of some districts, flued walls are requisite. It must be borne in mind, however, that little firing should be applied in the early part of the season, the object being not to force forward the blossoming of the trees in spring, but to accelerate the ripening of the fruit and wood in autumn.\* The maturation of the wood may, in some cases, require the border to be thatched to throw off heavy rains, and lessen the flow of moisture to the shoots. Thorough draining, however, with the use of maiden loams unmanured, and rather shallow planting, in general will be sufficient without this thatching.

The following directions are given by Mr. W. Irving, gardener to Sir J. C. Swinburn, of Capheaton, N.B., and though the early use of heat is most suited for that northern climate, yet the other treatment may be adopted in any latitude. His flued walls are built in the common way, twelve feet high, with three turns, or levels, of flues, forty feet each in length, with a handsome trellis the height of the first flue, to save the trees from being scorched by the heat of the fire: this allows of more fire without hurting the trees.

\* As far north as Scotland, it is found desirable to hasten the blossom by lighting the fires earlier, and to continue them occasionally whilst the trees are blossoming.

The borders are composed of eighteen inches of the natural soil, which is strong clay, and eighteen inches of light soil from the fields, over a bottom of six inches of stones and lime-rubbish, all beat and smoothed together; the manure employed is stable-dung, soot, and vegetable mould. As soon as a tree comes into a bearing state, it will bear in whatever position the branches are laid, providing they have proper space to ripen their wood, which they ought at all times to have.

*Pruning.*—Unnail most of the tree, and cut out all the wood that is most worn out by last year's crop. Shorten such shoots as are wanted for new wood, and such as have not ripened their shoots to the point. All that have ripened their shoots to the point, lay in at full length, allowing them a proper distance, which adds greatly to the health and vigour of the tree, and likewise to the size and flavour of the fruit. Then nail them all neatly to the wall, with new shreds; save all the old shreds, and boil them, and lay them aside for summer nailing. When all is finished, wash the trees and walls all over with the following wash:—2 lbs. flowers of sulphur, 1 lb. soft-soap, and a few pints of soft-water. Boil the mixture slowly for some time, to promote the combination of the materials; take a tub (which should be kept for the purpose), fill it nearly full of soapsuds, and then put in a tolerable quantity of the boiled mixture, making

all milk-warm. Beginning at the one end of the wall, wash every part of the trees and wall by the aid of a syringe ; standing before the wall, so that the liquid may rebound on the back part of the tree, and enter the nail-holes and every crevice in the wall. It is proper to stir the liquid all the time of washing, to keep the sulphur mixed, otherwise it will settle to the bottom ; this wash becomes like a varnish on the trees. As soon as the sun shines on the trees and wall, the sulphur smells so strong that it clears all the insects from the trees and wall ; the soap prevents the sulphur from being washed off the trees readily. Wash frequently with soft-water, and sometimes with soap-suds, but not when the trees are tender, nor when the fruit is swelling, as it would taint the fruit. The winter is the best time for washing with soapsuds. When the flowers begin to open, put on a canvass shelter ; pull it up at night, and let it down all the day, except when the weather is wet or cold ; in such weather let the canvass remain all day upon the trees. Light fires every night in the evening, from the time the flower begins to open until the fruit is all stoned. Peaches and nectarines set best in a moderate heat, with plenty of fresh air. As soon as the weather is fine remove all the covering and fire-heat. Never again light a fire, unless at the time of the fruit ripening, and then only when the weather is wet ; for the sun at that time is strong, and the fire-heat stops the

dew from falling on the fruit ; but moderate dew adds to the flavour of it. As soon as the fruit is all off, wash the trees with soapsuds, and if the wood is not ripened, light fires to ripen it.

The canvass screens, employed by Mr. Irving, are made very neatly ; they are all joined together with a wall-plate at top, and another at bottom, and the rafters are mortised into them ; these rest on spikes of wood driven into the border, and the sheets are lashed to small beams at top and bottom. They are twenty feet long, draw up with pulleys, and are lashed together with small cord, which makes a handsome cover, almost as good as glass. (*Caled. Hort. Mem.* iv. 446.)

Mr. Irving's remarks, although no doubt founded on practice, contain a few points which may tend to mislead, and we beg to qualify them with a few practical remarks. In the first place, we would suggest, in the construction of flued walls, that the lower tier of flue be placed as low as possible, in order to warm the earth in contact with the roots. The utility of bottom-heat is becoming every day more manifest, and it is but a common-sense matter that the root be made to keep pace with the branches. In the second place, we would, if possible, dispense with the trellis. It is well known that a trellis is a waster of heat, or, in other words, by the author's own shewing, the use of the trellis permits a greater amount of fire-heat.

This is a thing to be avoided, for, in districts where coal is dear, it becomes a grave consideration how to economise in the consumption of this useful material. If the flue takes its first course along the bottom of the wall, the heat of course will be strongest there, but surely it would be better to place some non-conducting material in contact with that portion of the flue, which, if properly managed, would supersede the necessity of the trellis ; the best substance with which we are acquainted for this purpose is dry and new sawdust. An objection may here, however, be started, that this in the neighbourhood of the fire would be liable to ignite. Here, then, for a short space, some other substance might be used ; and pounded glass, the refuse of the glass-house, would perhaps answer the purpose. If we mistake not, this material was employed by Mr. Forrest some years since in the houses at Syon, where, we believe, the main piping from the steam apparatus, which had to travel some distance before branching into the respective houses, was imbedded in pounded glass. The next point in Mr. Irving's practice, to which we would allude, is the depth of soil he deems necessary. Three feet of soil may do in our southern counties, but will oftener produce failure than success in our more northern ones. Half a yard of this depth, moreover, is composed of strong clay ! Surely this is not to be recommended for general practice. Although peach

trees may succeed for a few years in so tenacious a compost, we should much doubt their permanency. We would rather advise two feet maximum of a good sound yet mellow loam.

Again, as to the wash recommended for dressing the trees after pruning and nailing. We approve of the articles used much, but we must be permitted to doubt the propriety of using so great an amount of soft soap. We would certainly advise persons about to experiment in this way to begin at one-half the strength as far as regards the soap ; the sulphur will do no harm. Moreover, Mr. Irving is rather indefinite as to the quantity of each article : “A few pints of soft water” is liable to a varied construction. “A tub filled nearly full of soapsuds,” too. He should have stated the size.

*Choice of Plants.*—This is of very considerable importance, for if the buds from which their heads were formed were not taken from well-ripened bearing wood, they will not be either very fruitful or long-lived. The stocks are also of first consideration, but this has been fully considered in the section on “**PROPAGATION.**” The following judicious observations on the choice of plants are made by Mr. J. Haythorn, of Wollaton Gardens :—

Maiden plants should always be chosen, as they may be trained in any way the purchaser pleases. The stock should have a clear stem, with but few

knots in it, or it will never swell out well ; and it ought to be budded from 3 feet to  $3\frac{1}{2}$  feet high, according to the height of the wall against which the tree is to be placed ; if budded lower, those branches near the ground become covered in the winter with wet and dirt, which causes the bark to crack and the branches to decay. If the tree is budded high enough the branches will radiate in every direction, and those that descend will be as fruitful as those that are horizontal or perpendicular ; and no part of the wood will suffer excepting the ends of the descending branches, which may be shortened during the winter-pruning, and they will again fill the wall the following season. (*Gard. Chron.* 1841, 166.)

We must here remark that we cannot conceive the plan adopted in the nurseries to be the best for obtaining long-lived trees. The buds, for the most part, are obtained from gross, young and watery shoots ; and this, generation after generation ; the object being to obtain showy trees, which generally sell the best. We would therefore advise, in the choice of trees from the nursery, not to be guided by mere strength, however specious it may appear, but to select those which are high-coloured in the bark, short-jointed, and with an equal division of strength on each side of the tree ; preferring those which possess strong shoots, as the lower arms with a centre of rather subordinate strength. Not a single blemish should exist on any part of

the main branches or the stock. We should, nevertheless, prefer good dwarfs to the half-standards of Mr. Haythorn ; we certainly have seen such trees answer admirably, but we must question the comparative durability of down-trained branches in the peach.

*Planting.*—If the plants are not budded on the stocks where they are to remain, which is the best mode, then select plants that have been budded three or four years, and remove them to their destination so soon as their leaves begin to fall at the end of October. Plant them 16 feet apart at the least, with the roots nine inches below the surface, and carefully arranged, so as to cover the greatest space possible. Let the stem be full three inches from the bottom of the wall, and inclining towards it. Nail the branches to the wall, but do not prune them until the end of November, when a patch of white lead should be instantly applied to the cut, in order to keep out air and moisture. The neglect of this precaution from the earliest stages of the tree's growth is, we are assured, the cause of the premature decay of the majority of peaches. This, we are persuaded, is the chief, if not the sole, cause of that discoloration in the wood which is often witnessed, and which is a sure precursor of a general breaking-up of the constitution. In nailing the branches of newly-planted trees, let very capacious shreds be used, for the soil, being newly-prepared, will settle considerably, and by

so doing, not unfrequently leaves the tree suspended by its fastenings.

*Pruning.*—We now come to the department of peach-culture on which there is some difference of opinion ; but we shall, as in other instances, consider, first, what is the object to be kept in view during the operation, and shall conclude by detailing the various modes suggested, with such observations as practice has suggested to us.

As the peach bears principally on shoots one year old, the object for the gardener to aim at, is to obtain annually a sufficient supply of these regularly distributed over all the branches of each tree. To do this the sap must be uniformly supplied to them. The shoots must be of moderate size, short-jointed, and well-ripened ; which is never the case with very robust, over-vigorous shoots. It is here, as is truly observed by Mr. J. Newington, that too many cultivators of the peach commit a fatal error, for they endeavour to procure annually a great supply of long and strong wood, sufficiently large to make basket-rods, and from these they expect a crop ; but nothing can be more unnatural or erroneous than this system of pruning. Whoever has seen the peach trees in Malta or America, and noticed the very short and small wood from which such large peaches are produced, would immediately contemn the above-noticed erroneous practice. Mr. Harrison, the eminent gar-

dener at Wortley, succeeded well with a bad system of pruning, by shortening his shoots severely ; but his garden lay extremely exposed to the winds, which are beneficial in moderating the luxuriance of growth of plants, and such situations are not as liable to chilly damps and blights as low and more sheltered places. The man who has cultivated the peach tree for some time must have observed that the branches which have lost their leading buds never fail to set their fruit well, and often for a long time continue to swell such fruit faster than branches that are crowned with luxuriant leading shoots. This may be accounted for by the ascending sap being carried forward by the luxuriant growth above, and thus depriving or carrying away from the fruit its natural juice ; they then wither and fall off. (*Gard. Mag.* vi. 55.)

In conformity with the principles we have noticed as just, we have the following general rules for pruning the peach, laid down by Mr. J. Craig, gardener to G. Cholmondley, Esq., of Howsham, Yorkshire.

If it is taken for granted that the most suitable wood for producing fruit is short-jointed and stiff (say from one-eighth to three-sixteenths of an inch in diameter), it remains to be considered how a regular supply of that wood is to be obtained, so far as pruning, &c., may effect it, where the soil and situation are not favourable for it on trees that have been some time established. In this case, transplantation, where

the trees are not too old, may be most judiciously resorted to for once; not so much for the purpose of the immediate checking of the tree as for repairing the substratum, and reducing the strength of the border by adding sand, &c. Were it possible to avoid it, do not let one of the fibres be damaged, more than their being necessarily out of their element for a few hours would cause. This would check the tree sufficiently for one year; and, in future, it would remain moderate, in consequence of the arrangements in the border, and the pruning to be adopted. Do not reckon upon a full crop of fruit the first year; because, if the young branches were generally luxuriant, it is probable they would not set much fruit; and, on any part that might be weak, do not allow any fruit to remain. In pruning, leave the branches thin, and shorten those which were vigorous to about two-thirds of their natural length, and those that were weak to one-third. In summer pruning, leave no more shoots than you calculate upon wanting in the ensuing spring, except where the branches were luxuriant; there leave rather more, according to vigour. Where a young shoot is luxuriant, stop it, and take off the superabundant shoots before autumn; by which, those shoots which are wanted would be more exposed to the influence of the sun and air, and ripen better. As soon as the leaves begin to drop in the autumn, thin off the ripest of them, by sweeping lightly over the leaves

with a few sprigs of birch tied on a stick : this gives the wood a better opportunity of ripening. When the trees are in an unfavourable soil and situation, and have got too old to be transplantable, and make wood too grassy to be fruitful, lay in the young branches very thin. But, when it is considered that strong branches not bearing fruit so well as weak ones is not so much by reason of their vigour as of their immaturity, the discrepancy will vanish: for, by their being thin, and properly exposed to the action of the weather, they will ripen much better ; and thereby, although strong, a crop of fruit may be obtained by leaving them a good length at the next spring pruning, except where a supply of wood is wanted. By their being thin, a greater quantity of young shoots, for fruit-bearers in the following year, may be left at the disbudding season, which will be pretty moderate. When the tree has carried one or two crops of fruit the point is gained, for we rarely see a fruit-bearing tree too luxuriant. (*Ibid.* vi. 430.)

We have rarely met with more judicious observations than those of Mr. Craig. It is plain to those who know the habits and cultivation of the peach from long experience, that such remarks would only emanate from long and, we will venture to say, successful practice.

*Methods of Training.—The French.*—No place in the world is more noted for the production of excel-

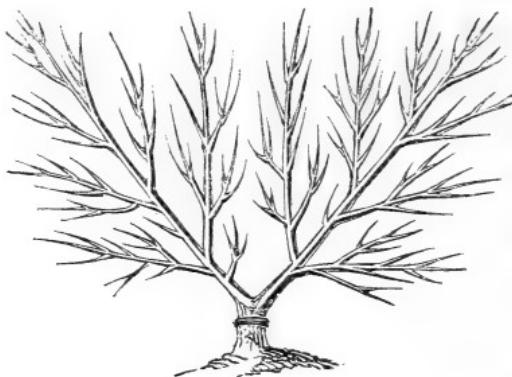
lent peaches than Montreuil, in the vicinity of Paris. Some notice of this has been taken in the first section of this volume; but the success which attends the practice there adopted requires that it should be more particularly noticed. We give such notice more readily because we have it detailed by Mr. J. Smith, gardener at Hopetown House, accompanied by his excellent comments.

The training of fruit-trees on walls, though an artificial operation, is not the work of arbitrary caprice. There are some limits which cannot be passed without nullifying the purpose of all training, viz., the production of fruit. These arise from the peculiar growth of the tree, its duration, the mode in which the fruit is produced, and other circumstances connected with the theory of vegetation. Thus, in the peach, the tendency to fork, and the growth of the fruit, not on spurs, but on the young wood, has introduced the semi-stellular or fan-training; at least in all cases in which its culture has been most skilfully practised. Other limits, such as the equilibrium of the sap, and the greatest possible facility of reproducing fruit-branches, have restricted the French to certain varieties of what has been called the open fan-training. All these modifications proceed upon a principle which is much insisted on, viz., the suppression of the direct channel of the sap. Most fruit-trees, when left to themselves, form an upright stem

or trunk, which conveys the nutritive juices from the roots to the upper extremities. This tendency shews itself even on walls, and hence apple and pear-trees have been generally trained with central trunks. It is also observable in the peach-tree, although in a less degree ; and we consequently find Forsyth, and a few of his followers, training it with the upright stem, from which all the subordinate branches diverge at right angles. This the French condemn, alleging that the sap is wholly carried up to the superior members. They also proscribe the fan-training with a central limb (our common form), on the score of its being destructive of equilibrium. They therefore divide the tree into two equal portions, which they spread out diagonally, leaving the centre completely open. It does not seem very evident that this arrangement is indispensable to maintain the equilibrium ; but it certainly facilitates it greatly ; and, besides, it enables the cultivator to accommodate the tree to low walls, and, by preventing confusion and irregularity, contributes much to ease and freedom in the operations of pruning and training.

1. The form of training which is most generally adopted in France, is that of Montreuil. It appears to have been first invented about the beginning of last century ; but it was scarcely known before 1755, when it was brought into notice by the Abbe Roger Schabol, the most eminent French horticulturist of

his time. According to the principle already mentioned, the tree is divided into two equal parts, in the form of the letter V. In order to effect this, two, and sometimes four, principal branches (mother-branches) are established, which constitute, as it were, the skeleton of the tree. The following sketch from the "Bon Jardinier" of a tree three years trained, will give an idea of the arrangement. In the case of the two mother-branches, they are attached to the wall at an angle of 45 degs.; but when there are four, the centre angle is somewhat less. Although recom-



mended in most French works, it is not advisable to fix the branches at first in so low a position as they are ultimately to occupy, since the branches in the centre will invariably get the start of the others, as has been experienced in certain attempts at imitation in this country. The other branches are all situated on these principal limbs, and diverge from them at angles varying with the age and vigour of the tree.

Great care is taken to preserve them in due subordination to the leaders. The bearing shoots are treated pretty much as they are in this country. In the execution of the training, the operations above described are more or less applied, according to the intelligence of the cultivator.

2. The next form which we shall notice, and which is at least ingenious, is that termed by Count Lelieur the form *a la Dumoutier*, from the name of its inventor. It is stated to be an improvement of the V of Montreuil, and to be distinguished from it and all others, in being less divaricated,—in having its principal members more strongly marked,—and by the entire renovation of the bearing shoots every year, which, being cut down almost to their insertion, give a pinnated appearance to the branches. The following account is gathered from the “Pomone Francaise,” a work of considerable merit, although it patronizes one mode of operation exclusively, and passes over all others in silence. As is commonly practised, the stock (of almond, or plum) is planted where the tree is destined to grow, and in the following summer two buds, nearly opposite to each other, are inserted. These produce two shoots, the future mother-branches, which are trained (Fig. 2) nearly in a vertical position, and ought to be as equal in strength as possible. At the first pruning they are cut down to about 15 or 18 inches in length, and the buds, both before and

behind, are rubbed off. The result of the second year's growth is the prolongation of the mother branches (*a*, Fig. 3), and the addition of another



Fig. 2.

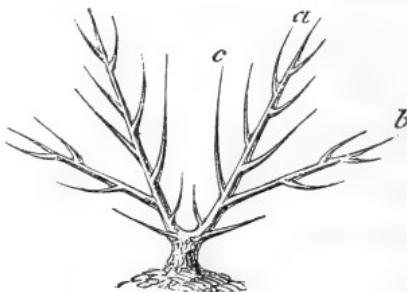


Fig. 3.

branch (*b*) on the outside of each. The following summer affords a third pair (*c*) ; and at the end of that season the tree has the appearance indicated by Fig. 3. During the fourth or fifth year, each of the branches *a*, *b*, *c*, divides into two. Of these three, viz., *a*, *b*, *c*, (Fig. 4) proceed in their original direction, while the others (*d*, *e*, *h*), diverge, and become subordinate members. The next two seasons produce

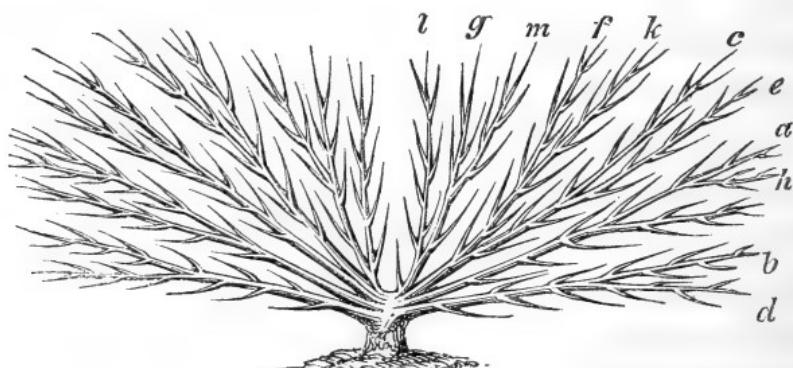


Fig. 4.

the remainder (*f, g, h, l, m*), which complete the development of the tree. Every successive year brings the mother-shoots a little lower, till they are inclined at about an angle of 25 degs. The annexed figure is from a tree which, in nine years, covered a space of wall 42 feet long, and 8 feet high.

The points of the leading shoots are shortened every year to such an extent as circumstances require. So much is symmetry studied, that Count Lelieur instructs us to ensure the equality of both sides by admeasurement; and he assures us that this is always possible, if the tree has been properly managed. In order to produce this, however, the most scrupulous attention is given to regularity ; all the means of equalizing the branches are called into exercise, and even the lateral twigs, and those portions of the shoots which are to be cut off in the pruning, are carefully arranged and manipulated.

The pruning for fruit commences in the third year, and is performed with much exactness. As already noticed, the whole of the bearing-wood, with perhaps a few exceptions, is renewed every year. The lateral shoots which appear during summer at the extremity of the leading branches, are cut back to a single eye, together with all other shoots which have no fruit-buds, and at the same time are feeble. When a shoot promises blossom, it is generally at some distance from the point of insertion into the

old wood, and the intermediate space is covered by wood-buds. All the latter, therefore, which are between the old wood, *a*, and the blossom, *c* (Fig. 5), ex-

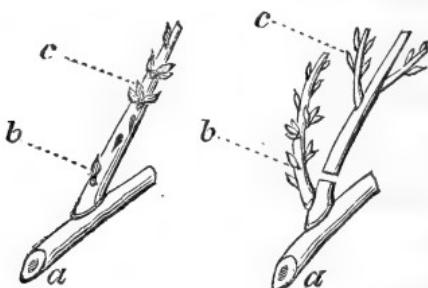


Fig. 5.

cept the lowest, *b*, are carefully removed by disbudding. This never fails to produce a shoot, the growth of which is favoured by destroying the useless spray above the blossoms, and pinching off the points of those which are necessary to perfect the fruit. This is termed the replacing bud. Barren shoots, when too vigorous to be cut down to their lowest eye, are treated exactly in the same manner. At the winter pruning, the branches which have borne fruit are cut down to the insertion of the replacing shoots, which, in their turn, are disbudded, bear fruit, and are cut out like their predecessors. In cases where the blossom has failed in setting, or the fruit in stoning, when the shoot is too weak to ripen the fruit which are upon it, or when the crop is very early, this operation may be performed at any period in the course of the summer. It is then called "return-

ing to the green shoot." Occasionally, a very promising shoot which has already fruited is allowed to remain. The replacing shoot is cut back to its lowest eye ; or, if it is vigorous, and there is room, it is made in the usual way to produce a substitute. In either case, a new replacing shoot is obtained, to which the whole is invariably shortened at the end of the second year. The branch thus treated is styled the reserve branch.

It is to be remarked, that the replacing shoot, and the branch of reserve, form a part of the Montreuil system of pruning for fruit, but less attention seems to be bestowed upon them, and the rapprochement or cutting back is not so rigorously performed, for we find the fruit-branches passing into subordinate members, while, in the form we have just now described, they remain single and undivided. It is obvious that these operations might be applied to any system of training, even by those who would hesitate to adopt one of the French forms in all its details. It is but justice to observe, that a near approach to these operations has been made by Harrison, in his excellent directions in this department of the culture of peaches.

3. There is yet another variety of the Montreuil form, denominated *a la Sieulle*. The tree is likewise formed upon two mother branches, which, being selected in the first summer, are permanently fixed at the inclination of from 25 to 30 degs., leaving, con-

sequently, a very large angle in the centre. These leading branches are never shortened. Late in the first autumn all the buds are removed except three, one of which is terminal, the other two are at equal distances on opposite sides of the shoot, the one on the outside being nearest the stem. The growth of the second summer lengthens the shoots in their original direction, and produces one from each of the reserved buds. At the beginning of the second winter, the leading shoots are again laid in at full length; the side shoots are shortened about one-third; and, as before, only three buds are allowed to remain. After the lapse of another year, the tree has assumed the following appearance (Fig. 6). Fig. 7 represents a side

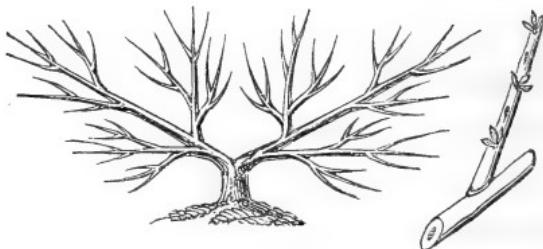


Fig. 6.

Fig. 7.

shoot, after being shortened and disbudded. The same process is continually repeated. The mother-branches grow on in a straight line, and those on the sides pass into subordinate members. This method proceeds upon the position, that fruit-trees are more weakened than strengthened by pruning. Sieulle was led to this conclusion by observing the effects of shears

in topiary work. There is, however, but little analogy between clipping and pruning ; and in old trees, where the two leading shoots bear no proportion to the others which are annually shortened, the principle is virtually given up. It must be admitted, however, that the continual disbudding economises the force of the tree, by limiting the number of shoots, and preventing the appearance of those which grow only to be cut off. A considerable diminution of labour is also gained in the busy period of summer.

Under this mode of pruning, the quantity of blossom is necessarily small, since only three double flower-buds at most are ever left on one shoot. This, however, obviates the necessity of thinning the crop, and is said to increase the size, and consequently the flavour of the fruit. In the climate of France, it should seem that the gardener may calculate on the setting of any given flower. (*Caled. Hort. Mem.*. iv. 144.)

The eminent success which has been known to accompany the cultivation of peaches in the neighbourhood of Montreuil is a sufficient warrant for paying every attention to the details of their practice. We think that there is little or nothing to be objected to on the score of principle, but many points which the British gardener would do well to imitate. The mode of starting their trees we hold to be of considerable importance : their adopting a pair of shoots

thus **V** as the foundation of the future fabric of the tree is an excellent step, and provides a sort of guarantee that the lower part of the wall shall be furnished. We hold it a principle that the centre of the tree should be composed of wood of a subordinate character. The modification of the strength of the tree may, however, be accomplished in the main by a judicious course of summer stopping, of which we will say more in its proper place.

As for the "form a la Dumoutier," and termed "a la Siculle," we can only say that they contain no important principle which is not embodied in the Montreuil mode, but are much more complicated, which, in England, is certainly no recommendation. The demands upon the gardener of these days have increased to such an amount, through the introduction of new plants, as also the carrying out the cultivation of things in general, that those modes must be esteemed preferable which accomplish the end in view in the most simple manner. Much, we opine, of the complication which exists in these matters proceeds from the want of a knowledge of the immense power which lays in the cultivator's hands to weaken the tree or to equalise its strength by means of judicious disbudding and stopping.

*Fan-training.*—This is the usual mode of training the peach in England, and the following directions for this mode of training are by an excellent practical

gardener :—The maiden plant is to be headed down to four eyes, placed in such a manner as to throw out two shoots on each side, as shewn in fig. 8. The following season the two uppermost shoots are to be



Fig. 8.—Fan-training ; first stage.

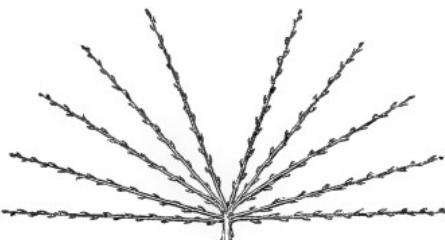


Fig. 9.—Fan-training ; second stage.

headed down to three eyes, placed in such a manner as to throw out one leading shoot, and one shoot on each side ; the two lowermost shoots are to be headed down to two eyes, so as to throw out one leading shoot, and one shoot on the uppermost side, as shown in fig. 9. We have now five leading shoots on each side, well placed, to form our future tree. Each of these shoots must be placed in the exact position in which it is to remain ; and as it is these shoots which are to form the leading character of the future tree, none of them are to be shortened. The tree should by no means be suffered to bear fruit this year. Each shoot must now be suffered to produce, besides the leading shoot at the extremity, two other shoots on the uppermost side, one near to the bottom, and one about midway up the stem ; there must also be

one shoot on the undermost side, placed about midway between the other two. All the other shoots must be pinched off in their infant state. The tree will then assume, at the end of the third year, the appearance shown in fig. 10. From this time it may be allowed to bear what crop of fruit the gardener thinks it able to carry; in determining which he ought never to overrate the vigour of the tree. All of these shoots, except the leading ones, must at the proper season be shortened, but to what length, must be left entirely to the judgment of the gardener; it, of course, depending upon the vigour of the tree. In shortening the shoot, care should be taken to cut back to a bud that will produce a shoot for the following year. Cut close to the bud, so that the wound may heal the following season. The following season, each shoot at the extremities of the leading branches should produce, besides the leading shoot, one on the upper and two on the under part, more or less, according to the vigour of the tree; whilst each

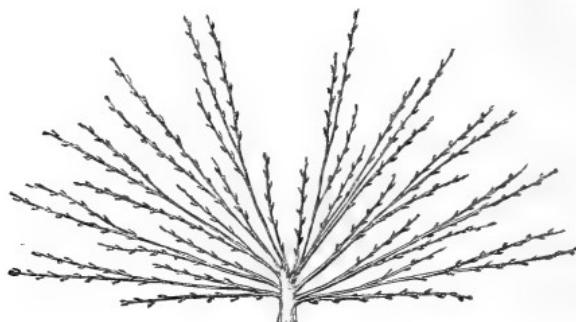


Fig. 10.—Fan-training; third stage

of the secondary branches should produce, besides the leading shoot, one other, placed near to the bottom ; for the grand art of pruning, in all systems to which this class of trees are subjected, consists in preserving a sufficient quantity of young wood at the bottom of the tree ; and on no account must the gardener cut clean away any shoots so placed without well considering if they will be wanted, not only for the present but for the future good appearance of the tree. The quantity of young wood annually laid in must depend upon the vigour of the tree. It would be ridiculous to lay the same quantity of wood into a weakly tree as into a tree full of vigour. The gardener here must use his own judgment. But if any of the leading shoots manifest a disposition to outstrip the others, a larger portion of young wood must be laid in, and a greater quantity of fruit than usual suffered to ripen on the over-vigorous branch ; at the same time, a smaller quantity of fruit than usual must be left to

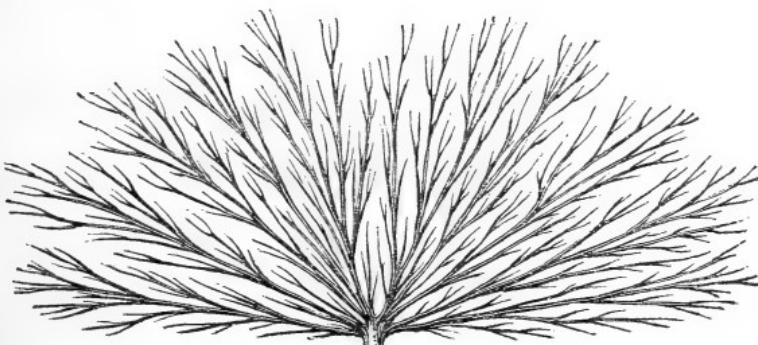


Fig. 11.—Fan-trained peach, in complete form.

ripen on the weaker branch. This will tend to restore the equilibrium better than any other method. Fig. 11 presents us with the figure of the tree in a more advanced state, well balanced, and well calculated for an equal distribution of sap all over its surface. Whenever any of the lower shoots have advanced so far as to incommod the others, they should be cut back to a yearling shoot: this will give them room, and keep the lower part of the tree in order. In nailing, care must be taken not to bruise any part of the shoot; the wounds made by the knife heal quickly, but a bruise often proves incurable. Never let a nail gall any part of the tree: it will endanger the life of the branch. In nailing in the young shoots, to look workmanlike, dispose them as straight and as regularly as possible. Whatever system of training is pursued, the leading branches should be laid in in the exact position they are to remain; for whenever a large branch is brought down to fill the lower part of the wall, the free ascent of the sap is obstructed by the extension of the upper and contraction of the lower parts of the branch. It is thus robbed of part of its former vigour, whilst it seldom fails to throw out immediately behind the part most bent one or more vigorous shoots. To assist the young practitioner in laying in the leading branches of the tree, the following method may perhaps be acceptable. Drive a nail into the wall, exactly where

the centre of the tree is to be ; then, with a string and chalk, describe a semicircle of any diameter, divide the quadrant into 90 degs. ; the lower branch will then take an elevation of about 12, the second of about  $27\frac{1}{2}$ , the third about 43, the fourth  $58\frac{1}{2}$ , and the fifth about  $74\frac{1}{2}$  degs. A nail should then be driven into each of these points, and the chalk rubbed off. (*Gard. Mag.* ii. 144.)

One chief objection to fan-training, though not the only one, is that even with the most successfully applied skill, the centre of the tree is almost always too bare of young and fruitful shoots. To obviate this, several modes of training have been adopted, the best of which are the following :—

*Mr. J. Seymour's Plan.*—Mr. J. Seymour carried his system very successfully into practice at Carlton, near Snaith, in Yorkshire, and is thus detailed by him :—

A maiden plant must be cut down to three eyes ; and three shoots being produced, the two lower ones are left at full length, and the succeeding spring the centre shoot is again cut down to three eyes. At the time of disbudding the trees, all the buds on the lower side of the two horizontal branches are rubbed off, and buds are left on the upper side of the branches at a distance of from nine to twelve inches from each other. These are suffered to grow five or six inches, and are then stopped, but still suffering

the leading shoot to extend itself. At the second spring-pruning, the centre shoot is again cut to three eyes ; or, if the tree be very vigorous, five eyes may be left ; two for each side, and a centre one for again furnishing the leading shoots. The leading shoots are laid in in the fan form, nine or ten inches from each other ; the shoots on the leading branch are nailed to the wall in summer, but after the winter's pruning they are tied to the leading shoots with strands of matting ; thus keeping the space between the leading shoots clear, for the succeeding summer's shoots to be nailed in, where they get well ripened, and mature their buds for another crop. At the winter's pruning they are cut to three or four inches, according to their strength, as in fig. 12, *a*. The



Fig. 12.

maiden plant being headed down, the first winter will present two side shoots, and the upright shoot shortened to three buds (*b*) ; the second year, at the end of summer, there will be four side shoots, and six or more laterals (*c*) ; in the following spring-pruning, the laterals (*d*), which had been nailed to the wall, are loosened and tied to their main shoot (*e*), and the

upright shoot shortened to three buds (*f*), as before. At the end of the third summer the laterals will be doubled on the old wood, by one having sprung from the base of the shoot tied in fig. 13 (*g*), and another from its extremity (*h*). In the pruning of the follow-

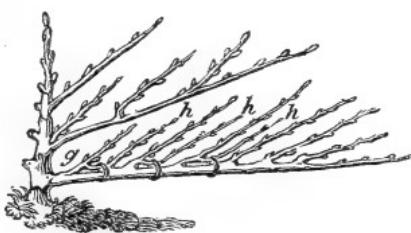


Fig. 13.

ing spring, the laterals of two years' growth, which had borne fruit, are cut off close, and the young late-

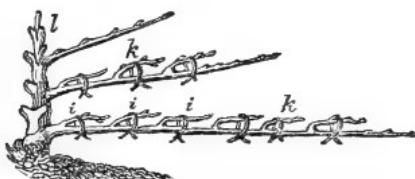


Fig. 14.

rals which had sprung from their base (*i*), fig. 14, are loosened from the wall, and tied down to succeed them; the other laterals (*k*) are tied in, and the upright shoots shortened (*l*) as before.

Now, or before, the side shoots will have to be headed down once, or even twice, so as to increase their number, and regularly cover the wall. The extent to which this practice is carried, will depend on

the height of the wall, and the distance of the trees from each other; the ultimate object being to produce a fan-form, as regular as possible, of permanent wood, with no young wood thereon besides what is produced along the spokes of the fan on the upper side, at about 12 inches apart, and the prolongation of the shoots.

In the course of the winter or spring of the third year shorten the side shoots to about 10 or 12 inches, as may be most convenient for wood buds, to get two principal leading shoots from each side shoot ; the first about three inches from the stem, as the bud may suit, and the other at the end of the shortened shoots, so as to double the leading shoots. The upright shoot is always cut at three of the lowest and most suitable buds, so as the stem may be kept as short as possible ; for, unless the side shoots are multiplied, the stem gets too high. If the sides shoots are strong the year after cutting down, they may be laid in their whole length ; but if weak, they must be cut short to give them strength. Continue in this way to double the side shoots for two or three years, by which the tree will get strength, and then it will admit of the side shoots being shortened to about 14 inches. Cut for two or three years, so as to produce three shoots upon each side shoot, and so continue until there is a sufficient number of leading shoots to furnish the wall.

After the tree has got into a bearing state, cut the lateral shoots to about eight or nine inches, taking

care to cut at a wood bud; and at the time of disbudding, leave the best situated buds, and those nearest the base, for the future year's bearing. (*Ibid.* i. 129, and ii. 296.)

Mr. Seymour's plan is a good one, and is very systematic. We have seen it in practice, and can vouch for its being successful, but we much fear that few could bestow the attention necessary at the respective periods; and if once neglected through pressure of business, the whole falls into confusion. Otherwise it is a most ingenious mode, and becomes an ornament to a garden.

*Mr. W. Seymour's Plan.*—This Mr. Seymour is gardener to H. Preston, Esq., of Morely, near York, and his system differs chiefly from that of his namesake in not removing the summer laterals, but training them in to be bearers, if not the next, the second year. His directions are as follow:—

In the spring, as soon as the young shoots have grown to about an inch long, begin to disbud or thumb-prune them, by taking off all the young shoots where there is no blossom or fruit, except the lowest one upon the bearing branch, and that at the extreme point of it: this end shoot allow to grow about three inches, and then stop; and break off all the buds by the fruit except four of their bottom leaves, so as to make a cover for the young fruit until the time of thinning, when those little spurs are to be taken away with the fruit that is not wanted, and the others re-

tained along with the fruit that is left. By so doing, we are only growing the shoot that we shall want next year for bearing fruit, which gives the trees an opportunity of extending themselves, and making good wood. Instead of taking off the summer laterals or water-shoots (as they are sometimes called), as is generally done, lay them in at regular distances, the same as a natural spring shoot; and, if they do not bear fruit the next summer, they will produce fine bearing-wood for a future year; so that you have not to shorten those strong shoots, but lay them in their whole length for main or secondary leading branches. When the young shoots at the base of the fruit-bearing ones, or the extending part of the leading branches, have grown 4 or 5 inches, tie them down to the other branches as close as they will admit without breaking or pinching them, and keep them close to the wall through the summer. By this means they will get perfectly ripe and firm, and not be so luxuriant as when permitted to grow from the wall almost wild; and the fruit must, of course, be larger when the wood is thin, than when it is permitted to grow twice as large as is necessary. There will be found, when disbudding, at the base of the shoots small buds that are not likely to make a shoot that season, but they must be retained, as they will produce a shoot in a future year, and then bring your young wood nearer home. (*Ibid.* vi. 435.)

We have some doubts of so extensive a use of summer laterals; we use them occasionally, but we take care to stop them when a few eyes long, for their tendency, if suffered to proceed unrestrained, is to augment the strength of the superior parts of the tree at the expense of the inferior.

*Mr. Mitchell's Plan.*—Mr. Mitchell, of Sudbury Garden, aims at having fewer leading branches than are usually worked in by other gardeners, whereby, he considers, more organizable matter is devoted to the production of bearing-wood. The following directions are from his own pen:—Below is a sketch of a Royal George peach tree planted on the back wall of a peach-house seven years ago. The figure in question was taken after the operation of pruning in the seventh year was completed, at which time it extended thirty-two feet in length. A correct idea will be obtained by referring to the woodcut, fig. 15 (a),

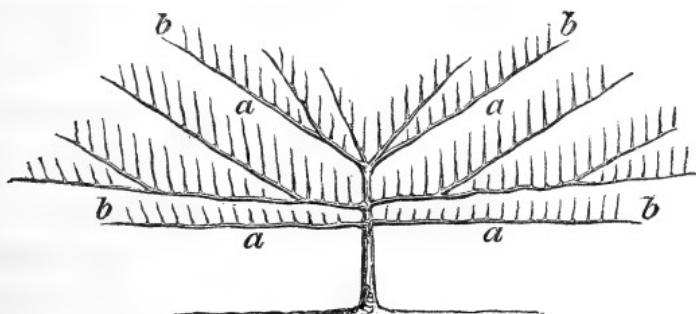


Fig. 15.

representing the leading branches, and (b) the fruit-bearing wood, which is regular and uniform in size

from the centre to the extremity of the tree. Nothing can be less difficult to manage, disbudding being attended to, and leaving the lowest bud on the wood (*b*), to produce a shoot for the following season; also the terminal bud on the wood (*b*) is allowed to grow a few inches before stopping it. With a little attention to tying, the work is finished till the winter pruning, which is done by cutting out the wood which produced the last crop, and tying in the young wood for the future crop. The merits of this system are the economising of organic matter in producing few leading branches, and an additional amount of fruit-bearing wood, with the leaves in a position fitted to take the greatest amount of advantage from the atmosphere and light. In proof of a vigorous constitution, the Horticultural Society of London awarded a medal to fruit gathered from this tree in 1842 and 1843. (*Gard. Journ.* 1845, 217.)

*Training on Low Walls.*—Mr. W. Seymour says,

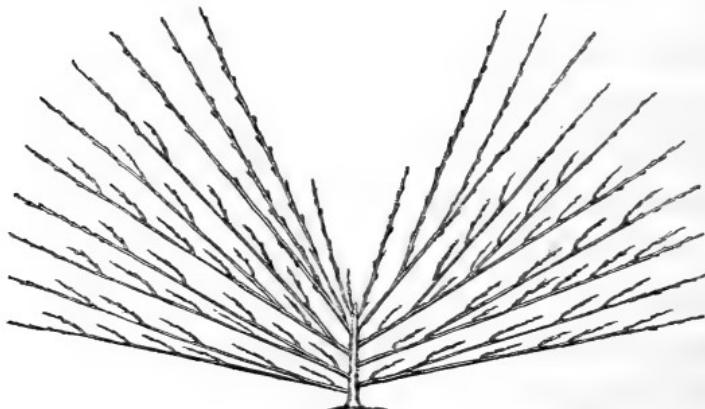


Fig. 16.

for training on low walls, take a maiden plant, and treat it as described in fig. 12, p. 100, so as to produce a tree in this form, fig. 16, and when it has grown too large for the wall, it may very easily be changed in figure, in the manner of fig. 17. By these means the fan, curvilinear, and horizontal style will be combined ; and the gardener will be prepared, in case of an accident, because any of the branches produced from *a a* may be made leading ones. (*Gard. Mag.* vi. 436.)

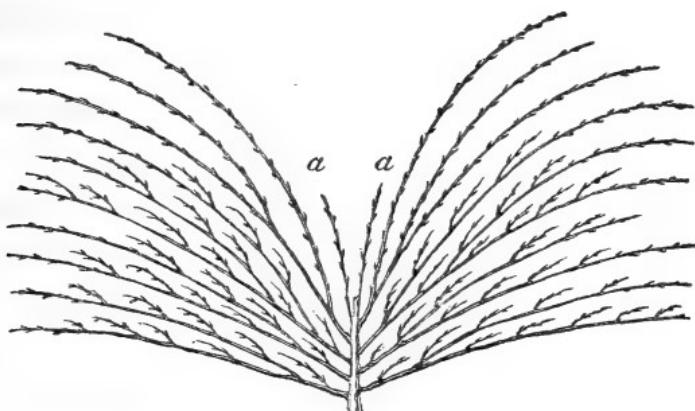


Fig. 17.

*Summer Pruning* is of far more importance than that of the winter.

In May and June, and occasionally in the succeeding months, it is necessary to regulate the shoots of the same year, and to prevent improper growths by disbudding. Pinch off fore-right buds or shoots ; and pinch off or cut out ill-placed, very weakly, spongy, and deformed shoots, retaining a plentiful supply of

good lateral shoots in all parts of the tree, and leaving a leader to each branch.

Let them mostly be trained in at full length, all summer, about three inches asunder, for next year's bearers ; and divest them of any lateral twigs to prevent a thicket-like intricacy, and to promote a healthy fruitful growth in the shoots themselves. In the course of the summer regulation, if any partial vacancy occurs, or should a young tree under training want an additional supply of wood, shorten some conveniently placed strong shoot, in June, to a few eyes, to furnish a supply of laterals the same season.

This disbudding and regulation should be done by degrees. If many shoots and leaves are removed suddenly, it occasions gumming, and over-luxuriance in the shoots that remain. If shoots are very strong, train them as nearly perpendicular as is admissible, that there may be no check to the sap's return. Shoots less robust train horizontally. (*Johnson's Dict. of Mod. Gardening.*)

Disbudding being one of the most important summer operations, some explanation of its principles and the mode of operation may prove useful. It is necessary to bear in mind that on the quality of foliage with which a tree is furnished depends the increase in diameter of the stem and branches, the extension and increase of roots, and the production of fruit ; and yet, that no more leaves should be retained than

can be freely exposed to light. In the case of a healthy tree, one-half of the shoots and foliage it naturally produces could not be thus exposed when trained against a wall. If all the branches of a round-headed standard tree were disposed in a flattened or fan-like manner against a wall, they would be greatly overcrowded ; for instead of a surface equal to that of a sphere, the foliage would be reduced within a diametrical section of the same, affording a surface of only one quarter of that which they formerly had. Hence it is evident that a considerable reduction of shoots produced by wall-trees must be effected in some way or other. This is partly done by shortening and

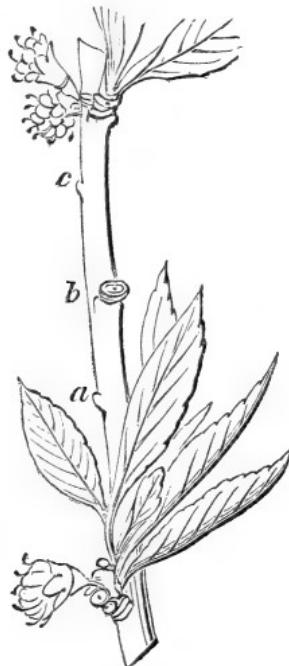


Fig. 18.

thinning at the winter pruning, and partly by the process of disbudding in summer. Let the accompanying wood-cut represent part of a bearing-shoot ; the lowest bud is left because it is the lowest, and is, therefore, most eligible for "training in" during the season, in order to furnish, next spring, a similar bearing-shoot to that now represented, which will be cut back to the said lowest shoot. The second bud from the base is also left, for the sake of a fruit-blossom which is connected with it. The shoots which were pushing at *a*, *b*, and *c*, fig. 18, are removed, or disbudded. In removing the buds, care should be taken not to injure the bark of the shoot. The buds, *a*, *b*, *c*, ought not to be all disbudded at the same time ; *b*, the fore-right one, should be first removed, and the others successively, at intervals of several days, in order not to check the circulation of sap by a too great privation of foliage at once. The terminal shoot is left because there is a blossom at its base. As was above observed, the lowest shoots must be preserved throughout the summer ; the other two having fruit at their base may be shortened back to about three inches after their leaves have attained the full size, and the base of the shoots has acquired some degree of firmness. The shoots of peach trees that have been neglected may be reduced to order without any material injury, if the removal of superfluous shoots is thus made by little at a time. (*Gard. Chron.* 1841, 380.)

*Stopping* the shoots in August, about the last week, is a very important operation. It is done by pinching off the leading bud of each, and thus preventing their increase of length concentrates the sap upon the wood, buds, &c. already formed, enables them to be more perfectly developed, and, being done late in the season, there is no danger of more laterals being induced. If the stopping is done too early, or if all the shoots are stopped at one time, laterals will be produced and the organizable matter be diminished from, instead of concentrated on, the bearing-wood of next year.

*Autumn Pruning* may be performed at the fall of the leaf, and thence, according to some professional writers, at any time in mild weather until spring. Let it be remembered that the earlier it is done in the autumn, the greater strength is given to the remaining shoots. It should be completed in February or early in March, before the blossom-buds are considerably advanced, which are distinguishable by being round, plump, and prominent, while the leaf and shoot-buds are oblong and narrow. Retain, in all parts of the tree, a competent supply of such regular grown shoots of last year as are apparently fruitful in blossom-buds. Most part of these should be shortened, not indiscriminately, but according to their strength and situation ; the very strong shoots should be left longer, being topped about one-fourth or one-

third. Shoots of middling vigour reduce one-third or one-half; and prune the very weak to two or three buds. Always cut at a shoot-bud to advance for a leader. Sometimes a shoot-bud lies between a twin blossom-bud; cut half an inch above the bud. As many new shoots as will lie from three to six inches asunder may be deemed a competent supply: remove or reduce some part of the former bearers. Cut out quite close the redundant, irregular, and other improper shoots: remove or reduce some parts of the former bearers of the two preceding years, cutting the most naked quite away, and others down to the most eligible young branch or well-placed shoot. Also take out all diseased and dead wood, retaining young where necessary to fill a vacuity. (*Johnson's Dict. Mod. Gardening.*)

*Sheltering the blossom* is an essential practice to secure a crop of peaches; for, at the time the blossom is opening in April and May, there invariably occur easterly winds and night frosts, which always prove fatal if the blossoms are exposed to them without shelter.

All cooling is occasioned either by the heat being conducted from a body by a colder, which is in contact with it, or by radiating from the body cooled, though circumstances accelerate or retard the radiation; and whatever checks the radiation of heat from a body is a screen, and keeps it warmer. For exam-

ple, a thermometer placed upon a grass-plot, exposed to a clear sky, fell to 35 degs.; but another thermometer, within a few yards of the preceding, but with the radiation of the rays of heat from the grass checked by no other covering than a cambric pocket-handkerchief, declined no lower than 42 degs. No difference of result occurs whether the radiating surface be parallel or perpendicular to the horizon; for when the mercury in a thermometer, hung against an openly-exposed wall, fell to 38 degs., another thermometer, against the same wall, but beneath a web of gauze stretched tightly, at a few inches distance, indicated a temperature of 43 degs.

These results explain the beneficial operation of apparently such slight screens to our wall-fruit when in blossom. A sheet of canvass or of netting prevents the direct radiation of heat from the wall; the cooling goes on more slowly, and is not reduced to that of the exterior air at night before the return of day begins to re-elevate the external temperature.

The colder the body surrounding another body, the more rapid the radiation from the latter; for it is a law of heat that it has a constant tendency to be diffused equally; and the greater the diversity of temperature between two bodies in contact with each other, the greater is the rapidity with which the progress towards equilibrium goes on. This is one reason why a temperature of 32 degs., with a brisk wind

attending it, will injure plants to a far greater extent than a temperature many degrees lower, with a still atmosphere ; but it is aided by the operation of another law of heat, viz., that aeriform bodies convey it from a cooling body, as a wall or a tree, by an actual change in the situation of their own particles. That portion of the air which is nearest to the cooling body is expanded, and becoming specifically lighter, ascends, and is replaced by a colder portion. This, in its turn, becomes heated and dilated, and gives place to another colder portion. And thus the process goes on, until the cooling body is reduced to the same temperature as the air.

In a still atmosphere, this goes on slowly ; the air in contact with the wall and tree rises very gradually as it imbibes warmth from them ; but if there be a brisk wind, a constant current of air at the lowest temperature then occurring, is brought in constant contact with them, and the cooling is rapid, in accordance with the law of equilibrium just noticed. A shelter of netting, or even the sprays of evergreens, are of the greatest service in preventing the sweeping contact of cold air at such times. Snow is good shelter ; it prevents heat radiating from plants ; protects them from the chilling blasts ; and is one of the worst conductors of heat. We have never known the surface of the earth, below a covering of snow, colder than 32 degs., even when the temperature of the air above has been 28 degs.

Strange as it may appear, yet it is nevertheless true, that a screen is more beneficial in preserving the temperature of trees, when from three to six inches from them, than when in immediate contact with their surfaces. When a woollen net was suspended four inches from the wall on which a peach tree was trained, the thermometer fell very slowly, and the lowest degree it reached was 38 degs. ; when the same screen was twelve inches off, it fell to 34 degs. ; and when drawn tightly over the tree, it barely kept above 32 degs., the temperature of the exterior air. When at twelve inches from the wall, it permitted the too free circulation of the air; and when in immediate contact with the polished bark of the peach, perhaps another law of cooling came into operation. The law is, that polished surfaces radiate heat slowest. Thus, if two glass bottles, equal in size and thickness of glass, and of the same shape, be filled with warm water, and one of the bottles be covered with an envelope of fine muslin, this bottle will give out heat to the surrounding air with much greater rapidity than the other bottle; so that, in a given time, the bottle with the envelop will be found colder than the one which has no covering.

Screens, such as the preceding, or the slightest agents, sprays of evergreens, placed before the branches of wall-trees or other plants, as already noticed, operate beneficially in another way, checking

the rapid passage of the air over them : such passage is detrimental in proportion to its rapidity, for the more rapid it is, the greater is the amount of evaporation, and, consequently, of cold produced. Mr. Daniell says, that “a surface which exhales one hundred parts of moisture when the air is calm, exhales one hundred and twenty-five parts when exposed to a moderate breeze, and one hundred and fifty parts when the wind is high.”

During all high winds, but especially when blowing from points varying between the east and the south, for they are the driest in this country, the gardener will always find shelter is beneficial to his plants, whether in blossom or with fruit in its first stages of growth, for these winds cause an evaporation much exceeding in amount the supply of moisture afforded by the roots.

In March, such shelters are much required, for the winds are then violent and dry even to a proverb ; but it is during the days of its successor, April, that sets in the only periodical wind known in this island. It comes intermittently, and with a variable force from points ranging from east to north-east, and is one of the most blighting winds we have. It continues until about the end of the second week in May, though often until its close ; and it is a good plan to have the tree, during the whole period, by day as well as by night, protected. This periodical wind is

occasioned, probably, by Sweden and Norway remaining covered with snow, whilst England is some 20 degrees or more warmer ; and an upper current of warm air is consequently flowing hence to those countries, whilst a cold under current is rushing hither to supply its place. This wind, and its consequent cold weather, is so regular in its appearance, that in Hampshire, and some other parts of England, the peasantry speak of it as “the black-thorn winter,” that bush being in blossom during a part of its continuance. (*Johnson's Principles of Gardening.*)

We have already noticed that very slight protection is sufficient to keep the blossoms in safety. One simple mode is to strain lines from the top of your wall to the ground, at an angle of 20 degs., and then to run haybands across from line to line at 18 inches distance. There is no better protection for peaches in spring. But there are many others ; spruce-fir-branches, for instance. (*Gard. Chron.* 1846, 650.)

Mr. Lee, of Ottery, St. Mary, Devonshire, has been in the habit of protecting his wall-fruit trees, during the period of flowering and setting of the fruit, with *common fern*. He merely inserts the fronds of the fern behind the branches, arranging them in front of, and in proportion to, the length of the shoots. (*Gard. Mag.* iv. 279.)

*Netting* is used in a very efficient manner in the garden of the Horticultural Society of London, to

protect a peach-wall. The stone coping of this wall projects over it about an inch and a half, with a groove or throating underneath. Coping-boards nine inches broad, fitted to join at their ends by means of plates of iron, are supported on iron brackets built into the wall. The annexed figure, 18, shews one of these brackets, in which *a* is an iron which is built into the wall, the thickness of a board below the stone coping; and *b*, the hole for the iron pin which secures the wooden coping. To these brackets the coping-boards are secured by broad-headed iron pins, passing through corresponding holes (*b*) in the board and

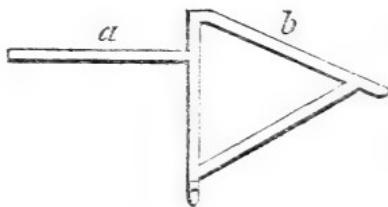


Fig. 18.

bracket, a slip of iron, or "spare-nail," being then introduced through an eye in the lower end of the pin. The upper edge of the board is slightly levelled, so as to fit as closely as possible to the under side of the coping of the wall, in order effectually to obstruct the radiation of heat, and the ascent of warm air. From this coping, woollen netting of various kinds, common netting such as fishermen use, bunting, and thin canvass, have been let down, and tried experimentally, in the course of the last fifteen years; and we are in-

formed by Mr. Thomson, that after repeated trials, the thin canvass was found the preferable article for utility, appearance, and duration. This description of fabric costs about 4d. per yard, procured from Dundee. It requires to be joined into convenient lengths, or into the whole length of the wall to be covered, and bound with tape at top and bottom, and to have loops or rings sewed to it at top, by which it is secured to small hooks screwed to the upper side of the coping-boards. These hooks serve also for attaching the ends of pieces of twine, which are stretched down to pegs driven in a line four feet from the bottom of the wall. These twine-rafters are stretched at intervals of twelve feet, and support the canvass at a uniform slope, the appearance being that of an elegant light roof, reaching to within three feet of the ground. The coping-boards are put up before the blossom-buds of the peach-trees are swelled so much as to exhibit the tips of the petals; and before the most forward buds open, the thin canvass (or netting, if that should be preferred,) should be attached to the hooks. The covering is generally put up about the beginning of March, and it remains on without being opened or altered, till all danger from frost is over, which is generally, in the climate of London, about the middle of May. The coping is entirely removed at the same time as the canvass, because the trees are found to thrive much better when exposed to perpendicular

rains and dews. The canvass is found to be of great utility in bright sunny weather, when the trees are in full blossom; for the peach and other stone-fruit, which in their native country blossom at an early period of the season, whilst the air is yet cool, do not succeed so well in setting when the blossoms are exposed to as much as 100 deg., which they frequently are, against a south wall. The thin canvass admits also plenty of air; while woollen netting, which it might be thought would admit still more air, was found to render the leaves too tender, in which case they suffer from the intensity of the light when the netting is removed. Common thread netting is not liable to produce this effect, being much more airy; and this netting has the advantage, when not placed farther than a foot from the wall, of admitting of the trees being syringed through it. Very little syringing, however, is required till the trees are out of blossom, and none while they are in blossom; and when the space between the canvass and the wall is nine inches wide at top, and four feet wide at the bottom, as in the Horticultural Society's garden, the syringing can be very well performed in the space within. Perhaps it would be an improvement in the case of the Horticultural Society's wall, to have the coping as much as eighteen inches wide, as no frost, unless very severe indeed, would injure the blossoms of fruit trees trained against a wall with such a projection; but the

iron fastenings for such a coping would require to be much stronger than for nine-inch copings, on account of the greater power which the wind would have over them. (*Loudon's Suburban Gard.* 175.)

For wall-trees, now that glass is become so much cheaper, the best of all screens may be employed, viz., glazed frames, of a length extending from the coping of the wall to the surface of the soil, about two feet from the stems of the trees.

There is some difference of opinion, we confess, even amongst practical men, as to the propriety of protection, but we can state that, after a trial of many years, we see no reason to doubt its efficacy, and could wish to see it both more generally adopted and rendered more complete than we usually find it. If the copings are temporary we would have them as wide as we could get them, providing they could be made safe. The arguments about excluding the dews we regard as nothing in this case; indeed, such are as well dispensed with during the blossoming period. The protection we use is a coarse canvass of an open texture; the meshes about the eighth of an inch in diameter. We generally put ours up a week or two before the blossoms open, in order to retard, or at least prevent, the too hurried opening of the blossoms, which may occur somewhat prematurely through intense sunshine. Great attention should be given as to the daily removal of it when the trees are in blos-

som, and, indeed, as long as it remains on the trees, for the blossom will soon become weak and the leaves etiolated if this point be neglected. When, however, a cutting east wind prevails, we make a point of leaving the canvass on : such winds do much damage in robbing both wall and tree of their heat.

*Thinning.*—The first thinning should take place when the fruit is about the size of peas, and should be performed with care ; a small but blunt pointed pair of scissors is often used with advantage, or the finger and thumb, with a small pointed stick, is very well adapted for removing them. At this thinning a few only should be taken. The second thinning should be performed when the fruit is about the size of small gooseberries. If this second thinning could be dispensed with, it would be of great advantage to the trees ; but from such causes as overcropping the preceding year, and the multiplied causes which affect the health of the trees, many of the fruit fall off during the season of stoning, so that experience has proved the necessity of leaving a few to be removed at this season. The quantity of fruit each tree should bear ought to be determined by the state of the tree itself. Sickly and young trees should be allowed to bear fewer fruit than the healthy and well-established plants ; and in either case those varieties which produce large fruit should not be allowed to mature so great a number as those which bear small fruit. Over-

luxuriant trees should be allowed to bear what is termed a heavy crop ; this will moderate their luxuriance, and prove beneficial to the tree itself. (*Gard. and Flor.* iii. 333.)

Thinning, like disbudding, is best done in a progressive way. Our practice is to go over in the first case and remove those which are in contact with each other, or at least one where two fruits touch. Where a good “set” occurs, they will soon require another thinning, and by this time those which are of superior character and size may be readily distinguished. Inferior fruit and cripples may now be removed, at least where too thick. By the time that the young shoots require tacking to the wall, a few more may require to be removed, and, by this time, some will be distorted by being squeezed between the shoots and the wall. These, if the crop be abundant, may at once be removed.

Perhaps the rule nearest to general applicability, is to have a space of nine inches between every brace of fruit upon the weaker shoots, and a six-inch space between those on the stronger ; but first-rate fruit of the large varieties should never be nearer than 12 inches to each other.

*Gathering* should take place a day or two before the fruit is to be used, and before it is dead ripe, and it should be laid on clean paper in the summer-fruit-room. Peaches may be gathered in the heat of the

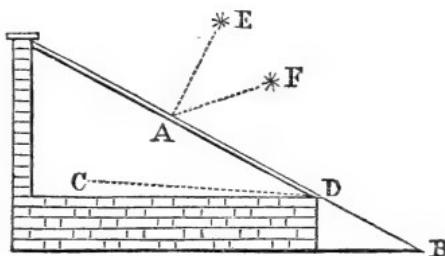
day without any deterioration of flavour ; in this respect they are very different from such northern fruits as the gooseberry, currant, and strawberry, which should be gathered in the morning. (*Suburban Gard.* 594.)

It is a common practice to lay littery material beneath the trees to save from bruising the fruit which falls, and sometimes those which fall are extremely luscious. We would, however, rather remove them from the tree by hand, but this is a practice which requires experience. In very hot weather some kinds of peaches will be ripe and soft on the high-coloured side, and quite hard on the other ; this seems to show that the ripening has been too hurried. Indeed, in hot summers, or periods of continued sunshine, we are persuaded that this is frequently the case, and that over quick ripening is antagonistic to high flavour. This principle is well known in the case of strawberries, melons, &c., and will be found to hold good with regard to the peach. Since it is impossible to tell when all kinds are ripe by mere appearance, a little thumbing becomes necessary, and a gentle squeeze at the point where the stalk joins the fruit will soon determine whether it be ripe enough. This mode, we confess, will produce a very trifling amount of discolouration, but if nicely managed such will hardly be seen ; and fruit which are somewhat soft at this point will generally be in prime order.

When peaches hang long on the tree after their usual period of maturity, their flavour invariably becomes deteriorated. Melting peaches, like the Late Admirable, become mealy, while the sugary nature of the juice is changed. Clingstone varieties, such as the Catherine, retain their qualities longer. (*Gard. Chron.* 1845, 820.)

#### PEACH-HOUSE.

*Its construction.*—The best form for a peach-house is thus described by the late T. A. Knight, Esq.



As the lights to be moved to the required extent with facility must necessarily be short, the back wall of the house must scarcely extend nine feet in height, and this height raises the rafters sufficiently high to permit the tallest person to walk with perfect convenience under them. The lights are divided in the middle at the point A, and the lower are made to slide down to the D, and the upper to the point A. The flue or hot water pipe enters on the east or west end, as most convenient, and passes within six inches of

the east and west wall, but not within less than two feet of the low front wall, and it returns in a parallel line through the middle of the house, in the direction either east or west, and goes out at the point at which it entered. The house takes two rows of peach or nectarine trees, one of which is trained on trellises, with intervals between for the gardener to pass, paralleled with the dotted line c. These trees must be planted between the flue and the front wall, and the other row near the back wall, against which they are to be trained.

If early varieties be planted in the front, and the earliest where the flue first enters, these being trained immediately over the flue, and at a small distance above it, will ripen first; and if the lower lights be drawn down in fine weather to the point b, every part of the fruit on the trees which are trained nearly horizontally along the dotted line c, will receive the full influence of the sun. The upper lights must be moved as usual by cords and pulleys, and if these be let down to the point a, after the fruit in the front tree is gathered, every part of the trees on the back wall will be fully exposed to the sun, at any period of the spring and summer after the middle of April, without the intervention of the glass. A single fireplace will be sufficient for a house fifty feet long, and the foregoing plan and dimensions will be found to combine more advantage than can ever be

obtained in a higher or wider house. Both the walls and flue must stand on arches, to permit the roots of the trees to extend themselves in every direction beyond the limits of the walls, for whatever be the more remote causes of mildew, the immediate cause generally appears to be want of moisture beneath the soil, with much dampness above it. A bar of wood must extend from **D** to **B**, opposite the middle of each lower light, to support it when drawn down. (*Knight's Papers*, 186.)

The angle recommended by Mr. Knight as being best for the peach-house is 34 degs. 55 min., supposing that the greatest attainable amount of light is required in May. This, however, was calculated for the latitude of his own residence, Downton, in Herefordshire; but as the latitude and the time when most light is required vary, we give the following rules as detailed by Mr. Caie, whereby any one may ascertain the most desirable angle for the roof of his peach-house, accordingly as circumstances vary.

In the construction of forcing-houses, the proper angles should be selected to suit the period intended for producing each particular crop, and to be adapted for different latitudes, to receive the most vertical rays of the sun for ripening the fruit. The sun's declination in each month:—

	DEG. MIN.
Jan. 21, the declination is, south ..	19 52
Feb. 21           ,,                     ,,	10 29

Mar. 21,	the declination is, north ..	0	19
Apr. 21	"	11	55
May 21	"	20	13
June 21	"	23	28
July 21	"	20	13
Aug. 21	"	12	27
Sept. 21	"	0	40
Oct. 21	south ..	10	46
Nov. 21	"	19	59
Dec. 21	"	23	28

When the sun has a north declination, or is north of the equator :—

	DEG. MIN.
From the degree of latitude, say ..	52 0
Subtract the sun's declination, suppose about the 22nd June, when it is highest .....	23 30
	<hr/>

The remainder gives the angle required 28 30

When the sun has a south declination, or is south of the equator :—

	DEG. MIN.
To the degree of latitude .....	52 0
Add the sun's declination, suppose about the 22nd Dec., when it is least .....	23 30
	<hr/>

The remainder gives the angle required 75 30

The degree of latitude must be that of the place where it is intended to erect the houses. (*Gard. Chron.* 1841, 198.)

The peach-house recommended by Mr. Knight is heated either by flues or hot water in pipes, but Mr. W. Henderson, gardener to W. F. Campbell, Esq.,

of Lanark, has furnished the following description of a peachery, very successfully heated, in part, by fermenting materials :—

The peach-house is 45 feet long, and 13 feet six inches wide ; the front of the house stands on pillars ; the trees are planted inside of the house, 14 inches from the front wall. There are two nine-inch courses of freestone above the border, and a sash ; which, including the top and bottom wall-plates of wood, makes the whole height of the front four feet six inches. A man can pass along the front, betwixt the trees and the upright sash, to prune and dress them as far as he can reach up. The trees are trained on a trellis of wood ; this, at first, is three and a half feet distant from the front sash ; after it passes the front sash, the trellis is parallel to the sloping glass, two feet three inches from the glass, and is continued thus to the top of the house. There is only one flue, which, coming from the back, at the east end of the house, runs along the middle of the border to the opposite end, and returns, entering into a chimney over the fire. Between the flue and the back wall, is a pit three feet deep, and four feet eight inches wide, which is kept filled with dead leaves of trees, the steam of which contributes much to the healthiness of the trees within the house. The flue is raised 19 inches above the border ; the return flue is contiguous to the pit, being separated only by a partition of bricks on edge.

The top of the flue thus doubled, being three feet wide, is covered with stone three inches thick, which forms a walk along the middle of the house. (*Hort. Soc. Trans.* vii. 209.)

The combination of a fermenting body with fire-heat is of course judicious, especially where a flue is employed, which is now generally considered a nuisance. We regret that Mr. Henderson did not state the precise position of the flue, which, we confess, we cannot infer from his paper. We have grown peaches by a similar plan, and have obtained several medals for them: our heating was, however, pipes in combination with the steam from leaves. Two feet three inches is rather too far from the roof. Ours is about eighteen inches, which distance we find amply sufficient.

Our own experience is decidedly in favour of hot water in tanks as a source of heat for the peach house; not only because it is the most regular and most manageable, but because, as observed by Mr. Liddiard, it is free from the noxious gases that escape through the joints of brick flues. Although good crops are produced from houses heated by flues, nevertheless, as they were generally heated by one flue, that part near the fire is always many degrees hotter than the opposite end, and this is unfavourable for the production of good fruit at an early season. Such an irregularity is obviated by the use of hot water, an equal degree of

temperature being secured in all parts of the house.  
(*Gard. Chron.* 1841, 198.)

*Temperature.*—As might be expected from the native country of the peach, it is very impatient of a high temperature in the early period of its vegetation. We have observed upon this, however, in a previous page. If the mean temperature of February amounts to 40 degs., and that of March to 44 or 45 degs., the peach tree will be in full flower against a wall with a south aspect about the last week in March ; and the general crop will be ripe in the last week of August, or first week of September, provided the mean temperature of April be 49 degs., May 55 degs., June 61 degs., July 64 degs , and that of August 63 degs. The period required for the maturation of the fruit from the time of flowering is, on the open wall, five months ; but it may be reduced to four by means of fire-heat and the protection of glass. It cannot, however, be advantageously diminished any further. This fact being borne in mind, it is easy for the gardener to know at what time to commence forcing his peaches in order to obtain a crop in a given month. As it must be flowered under a comparatively low degree of temperature, it cannot, therefore, be well forced simultaneously with the vine ; for the temperature of March, which in this climate seems to bring the peach into flower, does not unfold the buds of the vine, this being only effected a month

or six weeks farther in the season by a mean temperature of 55 degs. The peach may be subjected at first to a temperature of 45 degs., but not exceeding 55 degs. till the flowering is over, after which it may be gradually raised to 60 degs., and not exceeding 65 degs., till the substance of the stone is indurated ; and after this crisis from 65 to 70 degs. may be allowed. This is to be understood as referring to the application of fire-heat. Even in the total absence of the latter, sun-heat will frequently raise the temperature much higher ; but in this case a large portion of air should be supplied, not, however, all at once after the temperature of the house is found too high, but gradually as the temperature increases. Air should be always freely admitted through the day when the weather is at all favourable. (*Loudon's Suburban Gard.* 473.)

As it is injurious to subject the peach to a high day temperature during its blossoming period, so is it still more injurious to allow it to endure a high *night temperature*, at any time of its growth. We have had it as low as 34 degs. without any injury, both when the trees have been in blossom and when the fruit has been as large as small marbles ; and we are quite sure that from 40 to 45 degs. is the best night temperature during all its periods of growth. Some gardeners, however, use considerably higher temperature ; but although they obtain a ripe crop somewhat

earlier occasionally, yet it is always accompanied by a greater risk of total failure, and a certainty of having low-flavoured fruit.

Mr. W. Hutchinson, gardener at Eastington Park, is one who employs higher temperatures. His directions are to bring the trees into the house in mild weather, generally during November, a little earlier or later, according to the state of the weather; but not to start them all at once. The last lot are not put in until the 1st of January; any later than this would not answer, as the weather, if clear, is then hot through the day. He commences forcing them at 55 degs. at night, allowing the thermometer to fall to 50 degs. in the morning, if cold; but, if the weather is mild, never to fall below 55 degs., and from that to 60 degs. is the usual temperature kept up throughout the period of forcing during the night. During the day, he makes up for low night temperature, when he has the chance, by sun heat. He is not fastidious about a few degrees; to get it high enough is the main point—say from 70 to 85 and 90 degs., until the fruit is stoned; then keep them very hot during the day, viz., from 95 to 105 degs., and sometimes even as high as 110. Of course a great deal of moisture is required with this high temperature; syringe over head twice a day, and sometimes oftener, when the air is dry; you will seldom be troubled with either green-fly or red-spider. (*Gard. Chron.* 1844, 747.)

We confess ourselves somewhat alarmed at the free way in which Mr. Hutchinson deals with high temperatures. We do not doubt that he has been successful, but we much doubt whether all other parties will be so good root managers, and prove as successful as Mr. H. They are certainly temperatures which we should not indulge in without a necessity: still we should protest against any set rules which should proscribe an advance of a few degrees when a great amount of solar heat existed. Much depends on a good root, and much on the general amount of solar light at any given period. Above all, we say, be moderate at night; we have seldom known houses too low then.

*Borders.*—This subject has been fully considered whilst giving directions for wall culture, and we have nothing very particular to add to those directions for the formation of borders. Drainage is the first and most important consideration.

*Pruning and Training* are also the same as required for walls.

*Disbudding.*—Even under the best and most careful management, the peach-tree grows weaker when cultivated in a hot-house than when in the open air. To obviate this, and consequently to promote its strength, it is desirable to adopt every legitimate means, and foremost of these is disbudding. Mr. Liddiard judiciously directs, that, when the fruit is

about the size of peas, disbudding should commence, leaving very few shoots more than would be required for producing the following years' crop ; he first thins when the fruit is about the size of a hazel-nut, then when it is the size of a walnut, and lastly when the stone becomes hardened. The distance at which each fruit should be left depends upon the health and state of the tree. When the fruit is stoned, he raises the temperature to 60 degs., but gives little or no water until this has happened, when it may be supplied plentifully ; air is freely admitted as the fruit ripens, and some leaves removed to expose it to the sun, to increase the flavour, and to acquire a high colour. (*Ibid.* 1841, 198.)

Mr. Liddiard's practice is very good on the whole ; and we must add, that disbudding and stopping are of more importance, if possible, indoors than on the open wall. The disbudding indoors should (as before observed with regard to wall culture,) be performed a little at a time and frequently. Indeed, we disbud a few shoots almost daily when the fruit are swelling from the size of peas to that of a hazel-nut. Stopping, moreover, is equally important, providing any gross shoots arise. Such will assuredly rob the weaker parts of the tree if permitted to grow unstopped. This we think better than so much winter pruning, and may be termed a preventive system.

*Stopping.*—As soon as you perceive the least

change towards ripening in the fruit, stop the points of all the young wood, with the exception of a few of the weakest shoots at the lower part of the tree, and these keep growing until the end of the season, in order to get as much sap in them as possible. In the course of their ripening, abundance of air is to be given both night and day, and every leaf which shades the fruit is to be entirely removed. They cannot ripen too slowly ; the slower they ripen, if not absolutely starved, the better. Syringing is of course to be withheld altogether, as well as steaming, but as soon as the last fruit is gathered, the tree should be completely battered with water morning and evening, and the house shut up early in the afternoon, with a thermometer of ninety to ninety five degrees of sun-heat when it can be obtained, and this course persisted in until the leaves turn colour, when the heat by sunshine may range even higher still. By these means the wood is most completely ripened, and in pruning cuts more like oak than peach-wood. During all the ripening process the border inside the house should be allowed to become dry ; in fact, water entirely withheld from the moment the least appearance of change in a single peach is perceived towards ripening. (*Hort. Soc. Trans.* ii. 362.)

*Watering and Syringing.*—One essential for securing vigorous production in the peach-house is to have the roots of the trees well nourished. If these are

not duly supplied with moisture and food during the time the fruit is setting and swelling, a failure of the crop is inevitable. To secure such a supply, it is a most effectual treatment to give the border a top-dressing, at the close of February, of charred turf. Water, of course, must be given also, as the dryness of the soil and appearance of the trees indicate is necessary.

From the period that the fruit begin to swell off until they commence ripening, the trees must have most copious syringings and steamings, excepting that in the months of February or March, in cold dull weather, you must be a little more niggardly of water, taking care especially that, if you syringe in the afternoon, it is done early, so as to have the leaves dry by the evening; for a temperature of 34 to 40 degs. by night and a wet leaf would by no means agree.

*Impregnation.*—When the blossoms are well opened, impregnation should be assisted by applying the pollen to the stigma by means of a camel's-hair brush.

This is a crisis which requires some particular attention. The best way is to increase the temperature slightly, especially in the day time, and to give a freer circulation of air. The fires should be encouraged early in the morning, and as much air given betimes as will expel the confined damp; for, although a certain amount of moisture in the atmosphere is neces-

sary, especially during the night, to enable the flower bud to burst its bonds, yet, as Mr. Paxton long since urged, dryness is indispensable to the dispersion of the pollen. After a lively day of this kind, our practice is to give a slight syringing about four or five o'clock in the afternoon, and to take away all air immediately, resuming the practice in the next day before detailed. As soon as they are out of blossom we syringe them as freely as before, and, indeed, endeavour to produce abundance of atmospheric moisture. We thus proceed to the period of disbudding, which will extend over some three weeks, steadily increasing the day temperature, but using great moderation in the night. Indeed, the day temperature must not be hedged in with any dry rules, but, in the main, regulated by the amount of light. As soon as the first swelling is completed and the stoning commences, we suffer the extreme points to extend somewhat freely without any stopping, unless in case of great luxuriance, still keeping up a sweet and somewhat moist air by frequent syringings, sprinkling floors, &c.

*Watering the Borders.*—This is a very important matter. If the borders had a proper watering at the period of closing the house, little more will be needed until the fruit is in rapid progress during the first swelling; in fact, when the fruit are as large as nuts. Liquid manure will then be of service, providing the

border is sound, and a healthy action of root is known to exist. We use guano water after the rate of six ounces to a gallon, blending therewith soot water, both highly clarified. The latter can scarcely be too strong. They will require such applications on the average about once in a fortnight up to the period when the last swelling commences, increasing the amount progressively. When the fruit begin to change, watering must immediately be withheld, but resumed again as soon as the last peach is gathered. More facts bearing on this part of the question will be found both in the preceding and succeeding matter.

*Prevention of Bruised Fruit.*—When it is quite ripe, the border should be covered with moss, or some soft substance, or nets suspended under the trees, to prevent those which drop off from being bruised; but the best flavour is obtained by gathering the fruit a day before it is dead ripe, and ripening it for twenty or thirty hours in the fruit-room. (*Suburban Gard.* 476.)

*Removal of Glass.*—It was the old-fashioned system to remove the sashes from the peach-house so soon as the fruit was ripened, and many ancient gardeners went the length of stating their conviction that the trees would cease to be fruitful unless they were thus exposed. That theirs was an erroneous conviction is proved by the fact that Mr. Errington, who is celebrated as a successful peach-grower, has peach-

trees in full vigour and productiveness growing under glass which has never been removed since they were planted.

Notwithstanding this, it is still a custom with many gardeners, when they have gathered the crop from their peach-house, to remove the sashes immediately and expose the trees to the open air. Though this is a common practice, we cannot imagine for what purpose it is done, or how peach trees can be benefited by being exposed to the air; it is not because the wood ripens sooner, or better, that the sashes are taken off; for neither of these effects can be produced by such treatment. We have, up to the time the fruit is gathered, treated the trees more like tender exotics than any thing else: for months they have been used to a warm humid atmosphere, many degrees above the temperature of the external air; their shoots and foliage are consequently tender, the sap is flowing rapidly and thinly, and the trees are luxuriating in a tropical climate. Suddenly, the sashes are removed, and they are subjected to all the vicissitudes of a British climate, exposed to the “pitiless storm,” the cold nights, and all the variations to which our climate is subject. A diminution in the temperature, of course, causes a diminution in the flow of the sap; the growth of the tree is partially arrested, and it does not regain its vigour for that season. These checks must have a most mischievous effect on the health of

the trees : it is certain that the wood is never perfectly ripened under this treatment. Thus trees that are forced in hothouses never last so long as those that are planted out of doors ; and the gardener frequently finds it necessary to give his plants, at least such as are forced early, “a rest” for one year ; that is, he does not force them, but leaves them to nature for a year, excepting the disbudding, pruning, and other necessary operations which they may require. Very fine fruit is grown in houses from which the sashes have been removed immediately after the fruit has been gathered ; but it requires no little skill to keep the trees in a healthy and bearing state. We must admit, too, that there are other circumstances prejudicial besides taking off the sashes, which tend to decrease the vigour of the trees ; but we think their removal to be the principal one. Unless, then, the sashes should be particularly wanted for some other purpose, we recommend their being kept on the house. Air may be admitted pretty freely during the day-time ; the trees may have a good watering over head two or three times a week, which will keep the leaves clean and enable them the better to perform the important functions allotted to them. When, however, the trees begin to exhibit symptoms of having completed their growth for the season, the syringing had better be discontinued. By these means the trees will go on regularly adding new

matter to the heart-wood, which, at the time of pruning, will be found hard and well-ripened, and with much less alburnum than those trees that have been exposed to wind and weather throughout the autumn and winter. (*Gard. Chron.* 1842, 494.)

There is certainly no real necessity for taking the roof-lights off, as is proved by daily experience. Nevertheless, if a house of the kind was not wanted for other purposes, we should have no objection to it, providing the trees were prepared for it by a gradual lowering of the temperature for a week or two previously, and providing, also, it was fine weather. The only reason we have, however, is, that in indifferent or cloudy periods the leaf would enjoy a greater amount of light, which we hold to be of great importance.

*Winter treatment.*—After the winter-pruning, immediately stop every wound, whether from pruning or from accident, with a coat of thick white paint; this is to be repeated on all the larger wounds. The wounds being dressed, immediately stove the house with sulphur blended with sawdust, and burnt in shallow pans; and afterwards dress the tree two or three times with soft soap, sulphur, and tobacco-water, brushing it carefully into every bud and crevice with a painting-brush. This mixture is not made so strong as recommended by some gardening authors, as Mr. Errington depends much on the careful brushing and flooding every part of the tree.

After the above fumigating and washing, about the middle of November, the shoots should be pruned and tied in, the borders lightly forked over, a little charred turf put on them inside, and some long litter, a foot deep, on the border outside, to protect the roots from frost.

*Other systems.*—Having given the results of our own experience, whether originally our own or confirmatory of the practices of others, we will now give the modes of forcing adopted by Mr. Henderson and Mr. Mearns, not because they differ from our own, but because they offer some useful hints.

*Mr. W. Henderson*, gardener to W. F. Campbell, Esq., of Lanark, directs the peach-forcer to shut up the house about the 1st of December. If the weather be mild, apply no fire-heat for two weeks; but if it be frosty, put on a little fire every night. In the course of four weeks the buds begin to swell; being at that time able to distinguish the best buds, prune and cut away as much as possible of the wood that bore the fruit last season, and tie in the young shoots that were made in the course of the summer. These shoots were allowed to grow upright, and were not tied down till this time. Cut out all the worst shoots, and leave none except those that are well-ripened, and full of perfect and strong flower-buds; these shoots shorten from fourteen to six inches, according to their strength, always observing to cut

them at a leaf-bud. Lay in the shoots that are to bear the peaches, from six to nine inches apart; after the young wood is all tied in, go over the trees, and rub or cut off a great number of the flower-buds, carefully observing to leave the best and strongest. When the peaches are set, and about the size of peas, give a gentle sprinkling over the leaves with water once every six or seven days in the forenoon, in order that the leaves may become dry before night; about the middle of March sprinkle the trees in the afternoon, this keeps the air in the house moist and kindly through the night. The trees now beginning to make wood for next year's crop, go over them with care, and rub off a quantity of the young shoots, observing to keep those which are left in a kind of regular order, none being preserved except where there is room for them. Do not tie in these young shoots that are left for next year's crop, but allow them to grow upright with their tops to the glass; by this means you do not crowd or disturb the shoots whereon the fruit is growing; there is sufficient of sun and air between these young upright shoots to ripen the peaches, and give them both fine colour and good flavour. As the season advances, give the trees a good sprinkling over the leaves, twice every week, between four and five o'clock in the afternoon, in order that they may get the benefit of the water through the night; continue the sprinkling while warm sunny

weather continues, but if the weather happens to be dull and cloudy, discontinue the sprinkling till warm sun returns. About two weeks after the peaches have taken the ripening swelling, stop the sprinkling, give the house a great deal of air, and keep no fire-heat through the day ; but, if the weather be dark or wet, put on a little fire every night. If the weather happens to be warm and dry, give the house air through the night, and no fire-heat. (*Hort. Soc. Trans.* vii. 210.)

*Mr. Mearns* does not approve of the Dutch method of resting the trees every alternate year, and considers the practice is a bad one, as the tree once forced, when due attention has been paid to the roots, is in the best state for early excitement again ; a tree taken direct from a wall not so, as it is excited two or three months before its natural season. If a judicious attention be paid to the roots, the same tree is far more successfully forced for a great many years. A late gardener to Lord Stafford told Mr. Mearns that an amateur clergyman near Norwich had successfully forced the same trees for more than thirty years. His practice was to take them up every season as soon as they had done growing, and to plant them against a northern aspect till the end of November, and in the mean time to clear all the soil from his border, and fill it again with well-prepared compost. His usual time to commence forcing was the beginning of January. Mr. Mearns had a small house erected for the experi-

ment at Shobdon Court, many years ago, to try the practice, and followed it up for two years with success; but the removal of the trees is unnecessary, as, with a due attention to the roots, the following method answers better, and is attended with much less trouble and expense than the above. There are few gardens that have so much north walling to spare, and a better end is obtained without the sacrifice. Confine the roots of the trees for forcing within a walled border of from four to six feet wide, according to the extent of surface which is desired for the trees to cover, and from sixteen to eighteen inches deep. The soil which is used to plant in, nothing else than the perfectly fresh turfy top from a good mellow loamy pasture field, coarsely chopped up; and if the trees are of a proper age, the crop will be as fine the first season as at any future period. Water plentifully, but judiciously, in the swelling season; but more plentifully in the last stage of swelling, and then the fruit will swell off to a fine size, if the following attentions are paid. As soon as the fruit begins to change colour, leave off watering the roots almost entirely, and none over the leaves and fruit till all is gathered; at the same time exposing them as much as possible to the direct action of the sun's rays and atmospheric air, till all is gathered; and that you may lose no time in forcing, by so much exposure to the atmospheric air and direct rays of light, allow the house to

be very hot in the morning before giving air ; and then give it by degrees, till the roof is completely thrown open ; and again, unless rain falls, do not shut up till late in the day, and then in sufficient time to allow of having a high temperature, either with fire or sun, so as to accelerate the forcing, till you commence gathering, at which period, if you have enough for the demand, keep all as open and exposed as possible, only sheltering from rain to the last, when you remove the lights, wash the trees several times powerfully, and give a good soaking to the roots, with soft, rain, river, or pond water. Renovate the roots every three or four years, by taking off six or eight inches from the top of the border, not even sparing the small roots ; and also a foot or eighteen inches from the extremity of the border, so as to clear away all the roots matted against the wall, and fill up the trench as at first with fresh turfy soil, and forking a portion in amongst the roots over all the border, so as to raise it a little above its former height ; by this practice the trees are sufficiently renovated for three or four years more, and do not receive such a check as by the Dutch practice. No tree will thrive, whatever the soil may be, if insects and moss are suffered to harbour upon them, and the best time to remove them is just when the winter pruning is over ; then go over every tree about the houses and walls, in the most careful manner ; first scraping off all possible extrane-

ous matter, after the trees are taken from the trellis or wall, with the following composition :—The strongest drainage of the farm-yard one gallon ; soft-soap 1 lb. ; flowers of brimstone 1 lb. ; mix ; let all stand for several days, stirring the mixture three or four times a day ; get ready some finely-sifted quicklime, and stir into it, till of the consistence of good stiff paint, when it is ready to be applied ; its effects are certain and excellent. Lay it on with painter's sash-tools, of different sizes. Coat over, carefully, every part of the tree so effectually, that not a bud, chink, or crevice escapes the mixture. Use the whitest lime for the hothouses, as, when dry, you can see any axil of a bud or crevice that may have escaped the first dressing ; and to make sure, go over them two or three times. After such a dressing, all animalcules are so completely destroyed, that neither green-fly, thrips, scale, or red spider, are to be seen during the season. As white lime does not look slightly upon wall-trees, either mix soot with it, or else use the mixture without either the soot or lime. (*Hort. Soc. Trans.* ii. 37.)

*Peach Trees and Vines together.*—Although, as we have said, it is difficult to force these in the same structure, yet the difficulty is not insurmountable. They are so forced at the Earl of Jersey's ; and Mr. R. F. D. Levington gives these directions for carrying it out. Where he so cultivated them the house

is forty feet long, by sixteen wide. It is heated by one furnace, situated at the east end. The first course of heat is carried immediately under the pavement to the front flue, by ascending into which, it rises one foot in the angle, two feet from the front, and the same from the end walls. It is carried along this flue thirty-six feet, descends under the pavement at the west end, and again rises two feet perpendicularly into the back flue, five feet from the end wall, and four from the front flue. This part of the flue is thirty feet long, and descends in like manner under the pavement at the east end, through which it passes into the chimney situated immediately over the furnace. It thus makes a circuit of one hundred feet, chiefly round the front half of the house. The stage occupies a space of thirty feet by eight, leaving a space of five feet at each end, which, by a partition of ornamental lattice-work, the full height of the glass and width of the stage, forms these spaces at each end into two very neat lobbies. These are appropriated to the growth of the finer sorts of climbing plants; and the stage is capable of containing from 800 to 1000 plants in pots. The peach-trellis occupies the whole length of the house, and contains a surface of 280 square feet, to which the trees are trained. The front wall is arched, and a prepared peach-border is made for the roots, two feet wide inside, and eight feet wide outside, and four feet deep. A shelf of

eight inches width is erected immediately under the sloping rafters in front, principally for the purpose of holding strawberry-pots, the fruit of which may be brought to perfection here at any season, with very little trouble. At other times the shelf may be useful in holding Cape bulbs, seedlings, and other dwarf plants. The vine-border is at the back of the house, whereby the site in front is gained for a peach-border, without the vines in anywise interfering with the growth of the peach-trees; and as vines seldom produce any fruit below the top of the upright rafters, which is the only space occupied by the peach-trees, the space occupied by them is entirely gained in this over the usual arrangement of hothouses. The pavement of the gangway is in front of the stage, which allows a space of three feet between the back flue and peach-trellis, elevated eighteen inches above the level of the lobbies, and the same length of the back flue and stage, thus affording an easy command over the stage and peach-trellis, and ascending by two steps at each end. Supposing the house to be now filled with the proper quantity of vines, peaches, and greenhouse plants; in the autumn, as soon as the vines are ripe, they should be let out of the house, by sliding down the lights, one at a time, in the fore part of a mild day, and the vines fastened carefully to the back wall, there to remain during the winter, or until the time of forcing arrives, when they may be taken in again, ob-

serving the same caution as before. The usual progressive degrees of heat are then to be attended to, as in the ordinary mode of peach forcing, which is the principal object here to be attended to, and such will perfectly suit the vines. By the same progressive stages of temperature, the ornamental plants will flourish and produce early flowers, which may either remain in the greenhouse, or be successively removed to decorate the drawing-room, &c. About the middle of May the plants will be turned out for the summer, and the stage may then be appropriated to dwarf vines in pots, figs, balsams, and other tender annual plants. (*Cal. Hort. Mem.* iv. 576.)

Although such may be accomplished, yet, we cannot but regard it as a retrograde step in the art of forcing. It is seldom that the trees endure long under such treatment, for it is obvious that a continual compromise must be taking place.

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## POT CULTURE.

FORCING the peach in pots is a most excellent mode, not only because it enables a succession to be obtained with least trouble and expense, but because it enables this fruit to be forced even where there is no regular peachery.

The fundamental rules to be kept in mind during

this mode of forcing are, 1st, that you must begin with maiden plants—that is, trees three years old from the time of their being budded, that have not borne fruit; 2ndly, that you use the smallest pots you can, every year, consistently with the size of the plants; and 3rdly, that you shift annually, disturbing the roots as little as possible, but removing the old soil as much as is consistent with this care.

The following directions for this mode of forcing are furnished by Mr. W. Hutchinson, gardener to E. J. Shirley, Esq., at Eatington Park:—

Procure good maiden plants, as soon after the leaves fall in autumn as possible; pot in sandy loam, enriched with one-fourth well-rotted sheep or cow-dung. Have three sizes of pots; the smallest 12 inches wide at top and 11 inches deep inside; the second size, 14 inches at top and 13 deep; the third size, 17 inches at top and 15 deep. After the plants are potted, plunge them in leaves, or any other litter, to save the roots and pots from the frost. If a pit or frame can be spared, it will be better to start the plants there the first year than to put them into pine-house heat at once. Cut down the plants to four or five eyes, and they will make as many shoots the first year. Place the plants in the pit or frame about the 1st of January, increasing the heat gradually, as the plants grow, to make the change to the pine-house as imperceptible as possible. All that will be required

during the first year is, to keep the plants clean by daily syringing, and to water at the root as necessity requires, and occasionally with liquid manure. When the trees have ripened their wood, let them be taken out, and placed behind a north wall. In September they may be shifted into the second-sized pots, picking off a little mould from the top and sides of the ball of earth. This will complete the first year. In January of the second year, place the plants in the pine-house at once. In pruning, cut in the shoots a little, according to their strength. If the plants have made good wood during the first year, they may be allowed to bear a few fruit during the second year. Water and syringe as formerly, till the wood is ripe; then take out the plants to their former situation behind the wall. By this time, if the trees have been managed properly, they will be fine stocky plants. Shift again in September; those that have grown strong, into the largest-sized pots; others, that may not have grown very vigorous, may be placed in the same pots again, after reducing the ball sufficiently to admit of a supply of fresh mould. This will complete the second year. Now, as the plants ought to be fit for work, put them in on December 1st of the second year. Syringe every morning with tepid water; keep the floor of the house damp by watering, and raise steam frequently by watering the flues or hot-water pipes. This must be particularly attended to. Keep

the temperature as low during the night, in December, as you can, consistently with keeping the pines in health, about 55 degs. Fahr.; from 5 to 10 degs. higher during the day; with sun, 10 to 15 degs. higher. Little or no air will be required during this month, unless the weather be very mild indeed. While the plants are in flower, syringing must be dispensed with, and great caution used that too much fire be not applied. One night's neglect at this stage will blast your hopes for one year. Sixty degrees at night during this time will be enough; and 75 degs., with sun, will not be too much during the day. As the season advances, after the fruit are set, keep about 65 degs. at night; sometimes, on mild nights, a little higher; on cold nights, somewhat lower; but during the day, with sun, push them on now from 80 to 85 degs., till the fruit are stoned, and begin to smell; they will then stand a strong heat, 90 to 95 degs., and even to 100 of Fahr.; but recollect that abundance of moisture must accompany this high temperature. Keep the passages and pipes watered often. In watering, give it in small quantities, sufficient to keep the trees moderately moist, till after the fruit are stoned, when give it very plentifully, keeping the roots quite wet till they begin to ripen. Then cover the surface of the pots with moss, to save watering, giving as little as possible till the fruit are all off.

(*Gard. Mag.* vii. 321, N.S.)

The temperatures employed by Mr. Hutchinson are as follow :—For the first it is kept at 55 degrees during the day, and afterwards as near 60 as possible, and when the sun shines air is sparingly admitted, but it would be more freely if it were not for pines being cultivated in the same house. During March, after the fruit is set, the day temperature is from 80 to 85 degs. ; but after the stones are formed, from 90 to 100 degs., but the night temperature never above 60. Trees have been thus forced until they were 16 years old, and will continue longer probably. (*Gard. Chron.* 1843, 267.) By employing such high temperatures, Mr. Hutchinson gathered ripe peaches on the 7th of April, though forcing only commenced on the 25th of November.

Facts are stubborn things, or we certainly should have hesitated before we recommended such very high temperatures. That peaches will endure a great amount of heat, we are perfectly aware ; but such a great amount of night heat is certainly unknown in our practice. Mr. Hutchinson has, however, it would appear, been successful. We would advise those beginning to try their hand at peach-forcing in pots to be content with a much more moderate amount—at least for a season. We are very partial to high temperatures during sunshine, provided a due motion or circulation of air is kept up, with some little moisture of a permanent character in the atmosphere. High

night heat will, we think, of course accelerate the ripening of the fruit, but assuredly it will be at the expense of the flavour. It should be borne in mind by all parties desirous of forcing good peaches, that much of our early forcing practised in these days is moulded in regard of temperatures by the great exhibition days in London. Therefore those who do not grow for exhibition purposes, may frequently steer a more moderate course.

Mr. Hutchinson, we see, advises a sandy loam. Surely a sound and somewhat tenacious loam will prove more durable. We would strongly advise the use of chopped turf, about six months old, for this purpose, handled by spade, but by no means by the riddle. We are somewhat surprised that neither turf nor liquid manure are named in Mr. Hutchinson's paper; the importance of these materials is now universally recognised both in horticulture and agriculture. Having tried, and, we think, proved, the utility of bone manure, we would recommend a portion to be used in the peach soil. What is termed boiled bone is the kind we use, and is chiefly composed of phosphate of lime. Be that as it may, we have frequently found strong and healthy roots pierced through the lumps. It should be of the character termed by the salesman "half-inch bone." The fine should be rejected, for it will only serve to block up the drainage, and is, we suspect, too powerful in its

immediate action for the young fibre. We would advise the strength or tenacity of the soil to be increased progressively with each shift, beginning with a somewhat sandy loam for the maiden plants, and using a loam of sounder character, and in rather larger masses at each successive shift. The drainage should be so complete that no subsequent waterings may by any means disarrange it ; more especially if liquid manure is systematically used ; which, however clarified—which it assuredly ought to be in all cases —has a continual tendency to close the pores of the soil, and of course to impede drainage, and exclude the beneficial agency of the atmosphere.

We would now add a remark on the very high ripening temperatures employed by Mr. Hutchinson, and to express a fear, that such will in general be accompanied by inferiority of flavour. This is not peculiar to the peach alone, but will be found to hold good with the melon, the strawberry, and even the grape and the pine apple. The elaboration and chemical changes necessary, in order to give high flavour in fruits, requires a given amount of time, in order to bring into play the whole capabilities of the plant.

The system of fruiting the peach in pots in pine-stoves is not to be generally advised ; that it may be accomplished, Mr. H. has shewn, and indeed it is no novel affair. Some compromise must, however, un-

avoidably take place, for the pine in its own nature requires at least twice the amount of atmospheric moisture on the average that is advisable for the peach. In these days of cheap glass, it would be much better to build very small houses or pits. Such would answer either as lean-to's or in the span-roof form, and might, for economy's sake, be so compact, that all the operations necessary might be performed from the outside by means of light sliding sashes; the building of course sunk very low. There would be no necessity for a walk inside, unless desired by the proprietor. The preservation of walks in the interior of forcing structures often leads to much needless expense.

Throughout the whole course of peach forcing, by whatever mode or in whatever structure, much atmospheric moisture must be secured, that is, providing much artificial heat be indulged in. The only exceptions to this are two periods: the one whilst blossoming, the other whilst in the ripe state. For pot culture, we apprehend that severe economy will, at times, still cause them to be grown in pine-stoves, or mixed up with other forcing. When such is the case, it will be expedient, after the fruit is gathered, to use sulphur liberally on the back of the leaf, provided the red spider has commenced operations.

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## DISEASES.

PLANTS, like animals, are liable to disease just in proportion as they are made to live in a climate differing little or much from that of the country in which they are natives. The climate of Persia differs greatly from that of Great Britain, and, as a consequence, the peach is here subject to peculiar diseases unknown as its ravagers in his native habitat. The chief differences between the climates of the two countries are the greater wetness of that of Great Britain, and the greater vicissitudes of temperature during its summers. To these differences may be traced the origin of all the diseases to which this fruit-tree is liable.

*Gumming* is an issue or extravasation of the sap of the peach tree, arising usually from its being formed more rapidly than it can be conveyed away by the sap vessels. When this occurs rupture must take place, for the force with which it is propelled during circulation, and consequently the force acting to burst the vessels during any check, is very much greater than could have been expected, before Mr. Hales demonstrated it by experiment. Now, we know that a much less pressure than any of those he ascertained would be capable of bursting the delicate membranes of any of their exterior descending sap vessels, and it is in such outer ducts that the injury first occurs. When one exterior vessel is ruptured, that next be-

neath it, having the supporting pressure removed, is enabled to follow the same course at the same locality ; and in proportion to the length of the time that the sap continues in excess, is the depth to which the mischief extends, and the quantity of sap extravasated. If the extravasation proceeds from this cause, there is but one course of treatment to be pursued ; sever one of the main roots to afford the tree immediate relief, and reduce the staple of the soil by removing some of it, and admixing less fertile earthy components, as sand or chalk. This must be done gradually, for the fibrous roots that are suited for the collection of food from a fertile soil are not at once adapted for the intro-susception of that from a less abundant pasturage. Care must be taken not to apply the above remedies before it is clearly ascertained that the cause is not an unnatural contraction of the sap vessels, because, in such case, the treatment might be injurious rather than beneficial. We have always found it arising from an excessive production of sap, if the tree when afflicted by extravasation produces at the same time super-luxuriant shoots. (*Johnson's Principles of Gardening.*)

Professor Lindley, with his usual ability, has traced the progress of this disease as follows :—Gum is the basis of vegetation, and he would not be very wrong who should assert that the whole framework of a plant is a skeleton of gum. This substance seems to

be formed by the decomposition of carbonic acid amongst water, with whose elements the young carbon combines. The first secretion that we find in a young seedling is gum, and out of that gum the organs of the tender plant are fashioned by the vital force. The first secretion that is formed by a full-grown plant, when it is roused from its winter's torpor and begins to grow, is gum, which in trees oozes out between the wood and bark, as cambium, causing the latter to "run," and enabling both those parts to increase in thickness. Gum also lubricates the delicate organs which are formed in the leaf-bud, and lengthen into leaves and branches. But as plants grow old gum disappears, the proportions of its element change, and it assumes the new forms of starch and wood, or it simply loses the water that dissolved it, and becomes a hardened coating to the minute cells and tubes of vegetable structure. When it is completely changed, or hardened, wood is said to be ripe; on the contrary, when it remains in the very state of gum, and still retains its water, wood is called unripe. In the former condition it offers great resistance to changes of temperature, suffering but little either from heat or cold, and it gives birth to branches firm and healthy like itself, because they are fed by a healthy mother. In the latter state, (that of unripeness,) it is extremely sensible of changes of temperature, its fluid expanding with force on either side of 40 degs. of Fahrenheit's scale, and

it brings forth sickly watery branches, because it cannot give them their duly-prepared supply of food. The point to be gained, then, is to secure the conversion of gum into some more dry and solid form of matter. This is the more important in a peach tree, because that plant, like all stone-fruit trees, naturally produces gum in excess, and it wants the power which many plants possess of rapidly converting it into something else. How is this to be done ? Gum is converted into starch or wood by the loss of a portion of the water in combination with it. A loss of one part of water in eleven produces starch, and of three parts in eleven produces wood. A separation of the water of combination is produced by heat and light, and by no other known agents. In proportion as the branches are heated and exposed to bright light are starch and wood formed at the expense of gum ; we may also conceive that, in a similar proportion, unchanged gum is dried off by the evaporation of its water of solution, and *vice versa*. Now, one of the first means to effect this end is to take care that no more wood is produced than can be fully exposed to sunlight ; and that all such wood is continually nailed close to a wall, whenever it is long enough to be so secured ; in order that the reflected heat of the wall may be absorbed by the branches. All the systems of leaving fore-right shoots, or of putting off summer pruning till the winter, and tucking in the

summer growth, according to the ignorant school of Forsyth, are in the most direct opposition to the ripening process, or, in other words, to the conversion of gum into starch and wood. This explains why peach trees grown in the open gardens of a nursery, where the temperature is low, are so peculiarly subject to gum. But all the exposure, thin training, and other expedients that can be thought of, in order to place the peach tree in a situation similar to that of its own Persian climate, will fail, if the roots are permitted to suck up moisture too abundantly from the soil, or if the air is so damp as to hinder the ready passage of water through the leaves. In order, therefore, to secure the ripening of wood, these points also are to be sedulously attended to. The border must not only be at all times well drained, but in localities where the air is inevitably very moist, and where, therefore, the leaves are incapable of perspiring copiously, the border must be maintained so dry that but little moisture shall find its way into the system of the trees ; for, by so doing, the leaves, which have little power of action, in consequence of the dampness of the air that surrounds them, will have little occasion to exercise such power as they possess ; and thus a due balance will be maintained between the perspiring powers of the leaves and the absorbing powers of the roots. When these things are neglected, the consequence is, that cold expanding the watery matter of the unripe wood

during winter, will force through the sides of the cells in which is lodged the gummy fluid, which, the moment this happens, loses its vitality and causes a decay of the surrounding parts ; or heat, when the sun beats fiercely on the branches, will produce the same effect—the inevitable result of which will be decay. The proximate cause of “the gum” may therefore be either exposure of unripe wood to the sun, or the action of frost upon it. Another cause, distinct from all these, may be the following :—Suppose that neither heat nor cold are sufficient to damage the unripe wood, the new sap will do it ; for in unripe wood the cells and vessels are filled unnaturally with crude fluid before the new sap enters them ; and the moment that new sap is introduced in addition, they become so distended, that a portion of their contents must escape. That portion flows into the intercellular cavities of the bark, thence finds its way to the exterior, and, having lost its vitality, immediately induces the decay of the surrounding parts. (*Gard. Chron.* 1844, 355.)

Although thorough drainage is a most effectual check upon the occurrence of gumming, by preventing the absorption of too much moisture under ordinary circumstances, yet, despite the best of drainage, this efflux of sap will occur if the soil of the border is allowed to become too dry, and then to be exposed to a fall of heavy rain. The vessels of the branches,

contracted by long exposure to drought, are unable to give passage to the consequent sudden great accession of sap. For such an event there is no remedy, but the preventive is obviously that of mulching and watering, in order to keep the trees in a free-growing state during the dry weather, so that when rain does come a full supply of moisture will be nothing more than what the trees have been accustomed to. (*Ibid.* 1843, 361.)

Gumming, however, also is the mere efflux of the sap from a wound, the best remedy for which is to cut the injured parts out cleanly with a very sharp knife, and excluding the entrance of wet by plastering it over with white-lead, or with a mixture of melted wax and resin. Such wounds frequently arise from the decay of abortive buds, both of wood-buds and blossom-buds. This abortiveness, observes Mr. Pearson, of Kinlet, near Bewdley, establishes itself earlier or later in the autumn, or probably from the vicissitudes of a severe winter. The abortive wood-buds are more numerous in those trees which are rather declining in vigour, or in those branches of a young tree which has been robbed of its portion of nourishment by its more robust neighbours, or, which is often the case, branches which have borne too much fruit. It matters little, however, in this case, how these abortive buds are established ; the fact is, they are established, and there the disease commences

its silent but certain and destructive operations. When the buds are dead, they, like all dead vegetable matter, become powerful absorbents of water, whether of the finely-divided vapours of the atmosphere, or the more condensed form of rain-water—hence, after rain, they become gorged with water. So long as these dead buds rest on the trees, there is little or no cicatrization between the dead buds and the branches which they rest on; or, at all events, not before they have been saturated with moisture, which first saturation, after death has taken place, enters into the most incipient fermentation with the sap of the plant, at the connection between the dead bud and the living branch. By the alternations of wintry weather, from wet to dry, and wet to frost, and frost to hot sunshine, as spring approaches, the frost, freezing the water in the dead buds, enlarges their capacity for holding their destructive element, which assists in carrying on the fermentation between the alburnum and the bark. In this infant stage of the disease, it is not discernible by ordinary observation, as the bark does not change its colour for some time after the disease has entered the system of the plant; and, if dry weather follow the recent establishment of it, its ravages are arrested for a time, but which, nevertheless, progress as the sap attenuates, when the disease again, but more plainly, manifests itself.

Another cause for gumming is a local contraction

of the sap vessels, which, preventing the sufficiently rapid progress of the sap, causes it to burst them and thus to find vent above the contraction.

Mr. J. Roberts, of Hampsthwaite, near Ripley, remarking upon the occurrence of this in the peach and nectarine, observes, that the more free-growing kinds, such as the French Mignonne, Royal George and Noblesse peaches, Violet Hative, and other nectarines, worked upon stubborn stocks, are most subject to it, and dwarfs more so than standards. In a few years there are large excrescences at the point of union of the bud with the stock, so that in that time the trees have shewn a premature decay. This arises from the want of reciprocity betwixt root and branch, and all the kind treatment imaginable cannot counteract the consequence. The sap in its downward direction meets a repulse, is propelled upwards into the channels already surcharged, when it procures for itself an outlet, and then gum disease, and a premature decay of the whole plant, is the consequence. (*Gard. Chron.* 1844, 389.)

The occurrence of gumming in the native climate of the peach is, we are given to understand, a rarity as compared with what afflicts it in Britain; and Mr. Errington observes that two great evils in cultivation conspire together to produce it, viz., unripeness of wood and abrasion or laceration of the bark. To these, however, may be added a sort of gangrenous

tendency, induced by pruning over-luxuriant shoots. For the latter we would urge what has before been pressed on the reader's attention, viz. to prevent over-luxuriance, by keeping the root under control from the very first. Secondly, to practise the preventive system of pruning, or rather of stopping; which consists in pinching off the terminal points of gross shoots in the growing season, when four or five buds in length. And thirdly, to make a point of sealing up the ends of the pruned shoots, when the trees are in the rest state, by rubbing white-lead (which is our practice) or other impervious matter on the newly-made incisure.

The influence of wet, together with atmospheric action, is well known, by the practice of generations, to be very inimical to the permanency of this tree. Indeed, we believe that from this, and unripeness in the wood, arise the great majority of evils that beset this highly-esteemed fruit. One passing remark we would here make, and that is, that where the gum unhappily breaks out—be it at what period it may—that it is the best policy to scrape it clean away, without abrasion of the bark, and to put a patch of the white-lead on the blemish whilst in a dry state. This we have practised for years, and the practice may be relied on.

*Shrivelling of the Points of the Shoots.*—This is almost or altogether caused by unripeness in the young wood, and generally brought about by too lux-

uriant growth, induced by a too liberal use of manures, together with too deep a soil. In our more northern counties this is a somewhat common occurrence ; and young trees purchased from the nurseries of a gross character, and planted in deep and rich soils, will sometimes make shoots three or four feet in length, which looks most flattering until the autumn arrives, when, if it prove ungenial, the points of such shoots wither and decay, and such is not unfrequently termed “ stricken” or blighted.

Now, were the gross young shoots of such trees to have their terminal points pinched off when about nine inches in length, their growth would be much moderated, and the side branches emanating therefrom would be produced in time to become permanent shoots of the future tree. Instead of this, we generally see them permitted to remain their whole length, and only shortened back at the winter's pruning ; when the side shoots, before alluded to, have yet to be produced ; in fact, a whole season may be said to be lost, and the whole system of the tree rendered more luxuriant than ever. The best mode of procedure in such cases is to take the tree carefully up and replant it with much care, taking care not to bruise the roots, or, if any become injured, to cut them clean away with a sharp knife, always cutting just beyond a tuft of fibres. The latter point we urge because we have found roots pruned back to a bare part always

more inclined to produce suckers, which are a source of some annoyance.

*Blistering of Leaves.*—Peach trees, especially if growing on ill-drained soils, are excessively liable to have blistered leaves, attended by a contraction of the midrib, and, in some instances, it extends to an unnatural thickening of the upper parenchymatous plate of the leaves. The French gardeners term this disease *la cloque*. We are inclined to the opinion that this disease arises from an excess of moisture being imbibed by the roots. An effort is made by the tree to enlarge its leaves for the elaboration of this excessive and diluted supply of sap, and in the effort the parenchyma of the leaves extends more rapidly than their ribs. Contortion is thus unavoidably induced. In a similar mode the pulp or parenchyma of the plum and cherry cause their cuticles to burst in wet weather. Acari frequently make their appearance upon such leaves, but these are attendants upon vegetable disease, not the cause. Thorough underdraining will probably prevent a recurrence of the evil; and in confirmation that the disease arises from excessive moisture, we may observe that the diseased leaves drop off, and none others occur so soon as the dry hot weather of summer is fairly established. Although, frequently, only some trees out of several against the same wall are thus diseased, this proves no more than that the unaffected trees are either

planted shallower, have roots that do not absorb moisture so fast as the others, or have a power in their leaves to transpire it more freely.

Professor Lindley, remarking upon this disease, observes, that when a plant remains in a healthy state, but its leaves are excessively distended with watery matter, the first thing that happens is an increase in size, or number, or perhaps in both, of the green bladders that lie between the veins of the leaves, and which, growing faster than the veins that bound them, form, as Mr. Johnson has stated, excrescences and expansions, presenting the appearance of blisters. This happens continually, in vineyards, to vines growing with great vigour, whose leaves will then present innumerable green bags, or bladders, springing up from their surface and deforming them.

The disease of the vine-leaf in a vineyard is of the same nature as the blister of the peach-leaf in front of a south wall. There is no essential difference between them; it is only one of degree, that of the peach being the more severe. In both instances the cause is the same; namely, the accumulation in the leaves of watery matter derived from the soil. If this be so, it can hardly be said that cold is the primary cause of the mischief; for no cold is experienced in those vineyards where the malady is the most conspicuous. We do not, however, entirely deny the evil influence of low temperature. It is very possible that it

does injure the delicate tissue of young leaves, and render it incapable of performing its allotted office. We believe, moreover, that the evil attendant upon an accumulation of watery matter in the foliage is aggravated by cold, which, no doubt, interferes with the great function of perspiration; for, in a warm climate, the peach would probably throw off its superfluous watery particles as fast as the leaves received them. What we contend for is, that cold must be regarded at most as a mere secondary cause; and that no such mischief as we see produced would arise if the wet of the soil did not overcharge and distend the leaves. It is, therefore, to the border that we should look; and our great object should be to guard the soil of newly-sprouting peach-trees from being suddenly filled with water, even although it is quickly drained off again. In the absence of this, we shall no more, by shades or coverings, prevent the leaves from blistering than we do in the case of vines by glazed roofs; and we doubt much whether, if the border were kept permanently clear of sudden and excessive accessions of water, any considerable amount of blister would appear, even although the leaves were left unguarded to the cold radiation, dangerous as that action is to plants so tender as the peach-tree. (*Gard. Chron.* 1845, 431.)

*Mildew*, whether on the stems of the wheat, or on the leaves of the chrysanthemum, pea, rose, or peach,

appears in the form of minute fungi, the roots of which penetrate the pores of the epidermis, rob the plant of its juices, and interrupt its respiration. There seems to us every reason to believe that the fungus is communicated to the plants from the soil. Every specimen of these fungi emits annually myriads of minute seeds, and these are wafted over the soil by the winds, vegetating and reproducing seed, if they have happened to be deposited in a favourable place, or remaining until the following spring without germinating. These fungi have the power of spreading also by stooling or throwing out offsets. They are never absent from a soil, and at some periods of its growth are annually to be found upon the plants liable to their inroads. They are more observed in cold, damp, muggy seasons, because such seasons are peculiarly favourable to the growth of all fungi. The best of all cures is a weak solution of common salt and water sprinkled over the foliage of the plant affected, by the aid of a painter's brush, or impelled by a syringe. Dissolve three ounces of the salt in each gallon of water, and repeat the application on two or three successive days, applying it during the evening. Nitre has been employed with similar success, using one ounce to each gallon. (*Johnson's Dict. of Mod. Gardening.*)

Dusting the leaves with flowers of sulphur is also a successful remedy.

The white parasitical fungi, that are either the cause or injurious consequence of the peach-leaf mildew, are *Oidium erysiphoides*, *Sporotrichum macro-spororum*, *Torula botryoides*, and *Erysiphe pannosa*. We have little doubt that these fungi never attack plants that are in good health, for we entertain the opinion that it is only the sap of diseased plants—sap in a state of decomposition—that is suited to be the food of the fungi. Prevention, therefore, is preferable to curative applications, and we have no doubt that if the peach tree is kept in due vigour by having the soil well drained, and prevented from excesses of either moisture or of dryness—and if its leaves are similarly protected from being exposed to sudden atmospheric changes—they will never be visited by mildew.

We are justified in this conclusion, because with this disease our peach trees, in the whole course of our practice, (which has extended over thirty years,) have seldom or never been troubled. Mildew of all kinds generally proceeds from an impeded root action, and we have generally found that stagnation suddenly caused, whether by excessive heat or drought, is liable to produce it, more especially if succeeded by much solar light. We have little doubt that in such cases the elaboration (by overtaking or being in advance of the absorbing power) produces more highly concentrated juices, which are adapted as pabulum

for this obscure class of parasites. The best preventive is a good top-dressing of rotten manure in the early part of June, and as soon as drought sets in a thorough soaking of water. If caused by bad and deep borders, the remedy must be sought in thorough drainage, or an entire renovation of the soil.

There is no doubt that some peaches are more liable to be visited by this disease than are others, and those are the kinds which are most luxuriant growers. It so happens that most of these have no glands at the bases of their leaves. This was long since noticed, and again lately commented upon by Mr. Blake, secretary to the Croydon Gardeners' Society. He observed that the kinds which have no glands are all subject to mildew; such as Double Montague, Ford's Seedling, Red Magdalen, Noblesse, Vanguard, Barrington, Grimwood's Royal George, Belle Bausse, and Early Galand. These kinds are all liable to be affected with the mildew, whether planted indoors or out, in any part of England: but then it is soon stopped; a little slackened lime and sulphur vivum settles it. There are a number of peaches, and very fine ones too, that possess glands; some with one, two, or three pairs of ovate, and some with the same number of reniform glands, all of which kinds resist the mildew. Mr. Blake trained the shoots of those with glands over those infected, and they would not receive the infection. (*Gard.*

*Journ.* 1846.) A fact strongly supporting the opinion we have expressed, that the mildew fungi only attacks those trees the sap of which is already in a state of incipient disease.

Again, Mr. J. Kirk, gardener at Smeaton, says that, if any of the trees are in a stunted or sickly state, he takes away all the old mould from the roots, as carefully as possible, and puts in its place fresh rotten turf from an old pasture, without any dung. Mr. Kirk has done this in many instances ; and all the times that he has practised it, the trees never failed, not only completely to recover their health, but to produce a crop of fine-swelled fruit. (*Caled Hort. Mem.* i 363.)

*Blotches in the shoots* is a gangrene, beginning in the form of specks, but gradually forming a decayed part, that, like the canker in the apple tree, destroys all the shoot beyond the infected part. It usually attacks ill-ripened shoots, and the only remedy we know of is to lop off those infected an inch or two below the blotch ; but, to prevent the occurrence of this disorder, use every means to ripen the wood thoroughly.

*Blotches on the fruit* are an induration or hardening of the skin, which seems to arise from its being exposed to sudden transitions of temperature. We never observed these blotches on forced peaches.

*Splitting of the fruit* arises from the sudden

application of moisture after much drought. This splitting occurs before they begin to ripen, and, to prevent it, it is necessary that the border should not be allowed at any time to become too dry; and further, that too much foliage should not be taken off at once; neither should insects be allowed to injure that which is left. If the trees are thus kept in health in dry weather, the fruit will not be affected when wet sets in. In watering, cold spring water must not be used. (*Gard. Chron.* 1844, 200.)

*Splitting of the stones* often occurs in late peaches when excessive rain penetrates to the roots of the trees, and there becomes stagnant, after a previously dry season : the stones of the fruit split, and the latter drops in consequence. This will not be the case if the borders have a sufficient supply of moisture throughout the summer, and no superabundance when the fruit is ripening off. (*Ibid.*)

*Wounds.*—After the winter-pruning, stop every wound made by the knife, and every place whence proceeds gummy exudations, with a coat of thick white paint ; this painting is repeated, and perhaps a third time, on all the larger wounds. This is found of eminent use, for it is a tolerably well-known fact, that the entrance of air and moisture into such wounds is in many cases the cause of premature decay. The wounds being dressed in this manner, immediately stove the house with sulphur, blended with sawdust,

and burnt in shallow pans, and afterwards dress the tree over two or three times with soft-soap, sulphur, and tobacco-water, brushing it carefully into every bud and crevice with a painting-brush. This mixture is not made so strong as recommended by some of our gardening authors, as Mr. Errington depends much on the careful brushing and flooding every part of the tree. (*Hort. Soc. Trans.* 360.)

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## INSECTS.

*Aphis Persicæ*.—This species of aphid is the earliest to appear in the spring, and, like others of the same genus, is the produce of eggs deposited by its parent in the previous autumn. It usually appears in damp chilly weather, when the air being full of moisture or haze, and associated by the commonalty with their appearance, the weather is said to be *blighting*. The fact that one aphid produces at the rate of twenty-five young ones per day for several months; that each young one begins to multiply as soon as it is born; that one aphid kept purposely in confinement saw nine generations in three months; that one aphid during its life may be the progenitor of no less than 5,904,900,000 descendants; and that the autumn-deposited brood are almost all simultaneously hatched in the spring; are facts quite sufficient

to account for the myriads of these pests which then occasionally appear, without having recourse to the ignorant suggestion that they are engendered by certain winds, or states of the atmosphere.

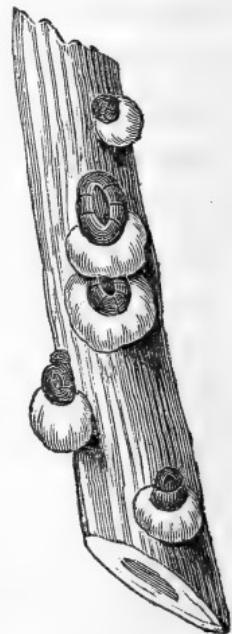
To prevent their appearance, take sulphur vivum, sifted lime, and Scotch snuff, equal quantities of each ; lamp-black, half the quantity ; mix them to the thickness of paint, with stale brine and soapsuds. With this mixture paint the wall and trees, and over all the buds, very early in the spring, just as they begin to shew colour. We doubt not that this is a serviceable wash ; and if the lamp-black causes an unsightly appearance, clay or some other substance must be substituted, to dilute and increase the bulk of the mixture, which otherwise may be too strong for the trees. (*Gard. Chron.* 1845, 154.)

If the aphides do make their appearance in the spring, syringe the trees on which they are with tobacco-water. Do it two or three times, after intervals of a day or two, and whilst the sun is shining upon the leaves.

*Brown Scale* appears to be the same as preys upon the grape-vine, (*Coccus vitis*), and like that tree the peach is liable to its attacks both under glass and in the open air. It is, says Mr. Curtis, a longish brown insect, which in old age assumes a blackish brown colour, and becomes hemispherical and wrinkled. The females are shield-like, being convex above and

flat or concave below ; they are furnished with six small legs, which, when the insect is old, become part of the substance of the body. On the under side of the insect is a sucker, with which it pierces the cuticle of the plants, and extracts their juices. Soon after impregnation the female dies, and her body becomes a protection for the eggs, which are covered with long white wool, and sometimes completely envelope the shoots of the vines, or of plants, growing underneath them. The males are furnished with four wings, and are apterous. Their powers of propagation are immense ; and, where they once become very numerous, they are exceedingly difficult to eradicate. This species belongs to the true genus *Coccus*, characterised by the female having a scale inseparable from her body. When young, both sexes are alike, but the male larvae produce two-winged insects, with two tail threads. The females have no wings, and their dead bodies, beneath which the young are sheltered, appear as in the annexed woodcut. (*Johnson and Errington on the Grape Vine*, ii. 136.)

This is decidedly one of the greatest pests in the peach-house, but, if the trees are painted over every



year at forcing-time with the mixture, according to the recipe of Mr. Kyle, they will be kept down ; the addition of a little glue or soft-soap to the mixture will be found beneficial ; keep a sharp look-out that none are left ; the injurious effects of these pests on the young wood is astonishing.

Mr. J. Kyle says that the following is a cure for mildew as well as the scale. Get some tenacious clay, and dilute it with water till it comes to the consistency of paint. To every gallon of the clay-paint add half a pound of sulphur ; mix them well, and paint the trees all over. It will be better to apply two dressings, and the second must not be put on till the first is thoroughly dry. The best season is when the buds begin to swell. To prevent rain washing it off from trees in the open air, it is advantageous to nail mats over the trees, taking them off when the weather is dry. It will require at least a fortnight to kill the scale ; when the clay drops off, it will bring all the scale with it. No mildew will make its appearance till July, and but little then compared with what there would have been without the application. If mildew does make its appearance, syringe the trees with water, and apply flour of sulphur through the rose of a large watering-pot. By dredging it on while the trees are wet, and leaving it on for a week, you will find that the mildew will be conquered. (*Gard. Chron.* 1841, 69.)

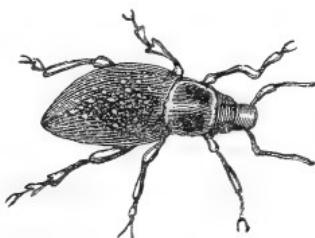
*Acarus (Erythræus) tellarius.*—The red spider.—

This pest of the gardener is very rarely found on the peach-tree, and never will occur if the air of the house is kept duly impregnated with watery vapour. Sulphur fumigations and a more free supply of atmospheric moisture will speedily remove and continue to exclude this insect.

The red spider cannot thrive—scarcely exist—where a sufficiency of water is regularly applied. As, however, syringing cannot be persisted in at all times, something else is requisite at those periods, when the syringe is laid by. Sulphur, then, is the best thing at present known for this purpose; but as many persons are deterred from the use of it, through a fear of its pernicious effects, we will here detail our mode of using it, by which we have been kept (we might almost say entirely) free of this pest for the last twelve years. We apply it about three or four times in the course of the year, to each house; the houses are on the average about 30 feet long, by some 16 feet wide, and we use about six ounces to each house each time, applied in the form of thick paint. The houses are heated by hot water, and the sulphur-paint is applied to the under or return pipe alone. The best way is to beat a lump of soft-soap, as large as a walnut, up in warm water; and to add some clay-water, made by working a lump of clay in warm water until the water becomes a thin paint; then to blend

this with the soap water; and finally to mix the sulphur also. The soap and the clay form a body, and prevent the sulphur washing or rubbing off. (*Johnson and Barnes on the Pine Apple*, ii. 128.)

*Otiorhyncus tenebricosus*.—The red-legged garden weevil.—The maggots of this are found round the base of the stems of wall-fruit, sometimes in very great quantities, a few inches below the surface, where they undergo their transformations. The beetles, which are old offenders, come out only at night to feed upon the buds of wall-fruit, doing great mischief to apricots, peaches, nectarines, plums, &c. They first destroy the fruit, and subsequently attack the bark and leaves, so as not unfrequently to endanger the life of the trees. They commence their depredations in April by eating the unexpanded blossom-buds, clearing out the centre, and leaving only the external bractea, and occasionally fragments of the immature leaves. They will thus proceed along a branch until all the buds are destroyed, and afterwards demolish the young eyes which ought to produce wood-shoots until nothing is left but the bare branches. The



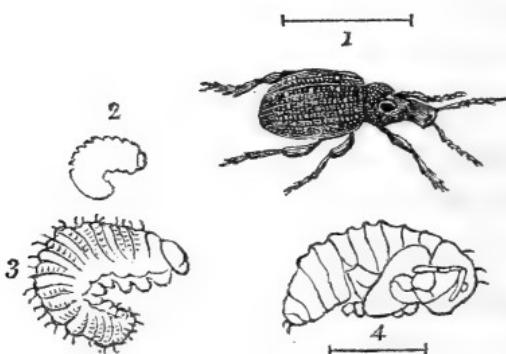
beetles bury themselves by day in the earth, close to the foundation of the wall to which the trees are trained, likewise round the stems of the trees, and most probably in chinks of the bricks, and other dark hiding-places. When recently hatched this insect is clothed with a delicate yellow pubescence, forming little irregular spots upon the elytra ; but they soon wear off and disappear, when it becomes of a shining black, inclining to a pitch colour. The larvæ of these otiorhynchi being as destructive as the perfect beetles, the main object ought to be to destroy the former, if possible, in the autumn, which probably would be most readily effected by stirring the earth all along the base of the wall and round the stems of the fruit-trees, and then sprinkling salt pretty thickly over the broken surface ; or salt and water, or, perhaps, liquid manure, might be equally beneficial—if hot, the better ; for it seems evident, from the peculiar spots in which they generate, or rather undergo their transformations, that situations sheltered in a great measure from the wet are most congenial to their habits. The beetles can only be arrested by hand-picking, with a candle and lantern, and afterwards pouring boiling water upon them, as their shells resist moderate heat. (*Gard. Chron.* 1842, 316.)

*Otiorhyncus (Curculio) oblongus*.—The Oblong Weevil.—This is of a reddish brown colour. It ap-

pears in May, and feeds on the young leaves of the peach, apricot, plum, pear and apple.

*Otiorhyncus (Curculio) sulcatus*, feeds upon both the leaves and fruit of the peach. Mr. Curtis describes it as a dull black weevil, with a stout proboscis, at the extremity of which is the mouth; the thorax is granulated, and the elytra are rough, with several elevated lines and minute ochre-coloured dots placed somewhat transversely; it has no wings. The period for the appearance of these weevils depends upon temperature, for May is mentioned by some, and June by others, as the months when they are mischievous in gardens, and in hothouses much earlier. Mr. E. Edwards says that he has seen them in an early viney at Studley Castle about the end of January, when they make great havoc amongst the young shoots and foliage; and from that time until the end of April they feed upon the buds and leaves, always high up, and never seen in the day. The eggs are deposited a little beneath the surface of the earth, and produce white maggots, and these live at the roots of the tree, rendering the plants weak and sickly; some say about June the maggots change to pupa, whilst others state that they live through the winter, and undergo their metamorphoses in the spring; however this may be, they remain in the chrysalis state only 14 days. The maggots also do great mischief to succulent and other plants in pots,

as well as in the border, such as Sedums, Saxifragas, the Trollius, Auriculas, and Primroses, eating round the tops of the roots and detaching them from the crown.



1. The Weevil. 2, 3. Maggots. 4. The Pupa. The straight lines show the natural length of the Weevil and Pupa.

*Curculio picipes* is a most destructive insect in the peachery as well as in the garden. This beetle is very similar in figure to *C. sulcatus*, but smaller, and forms, with about twenty other indigenous species, a genus called *Otiorhynchus*; they are also nearly alike in sculpture, but vary in tint. *C. picipes* being of a clay colour, the wing-cases more or less clouded with darker-coloured spots, and altogether it so much resembles in tone the clods and bark under and between which this insect secretes itself by day, that it is with difficulty detected. In the night these weevils sally forth to feed upon wall-fruit trees and the vines in hothouses, either attacking the stems of the new wood in April, which soon becomes black, or feeding

near the tips of the shoots. Every crevice in old garden-walls often swarm with these weevils. No-



thing would prove a greater check to their increase than stopping all crevices, or holes in the walls, with mortar, plaster-of-Paris, or Roman cement ; and the interior of hot-houses should be annually washed with lime ; the old bark of the vines under which they lurk should be stripped off early in the spring, and the roots examined in October, where they exhibit any unhealthy symptoms from the attacks of the maggots of *C. sulcatus* as soon as the beetles appear ; sieves should be held at night under the branches and leaves, when, by shaking them, the beetles will readily fall into the sieves, but as they drop down when approached, this operation must be proceeded with gently and quietly ; multitudes may be thus collected, both in and out of doors, and if the person who carries the light has a pail or jug of water, the sieves may be emptied into them as occasion may require ; but when the beetles are eventually destroyed, boiling, not warm water, must be used, as the hardness of their horny covering will resist a considerable degree of heat. When the larvæ are ascertained to reside at the base of a wall, salt might be

sprinkled, which will kill them as readily as it will the maggots in nuts; strong infusions of tobacco-water, aloes, and quassia, are also recommended. Where the blood of animals can be obtained, it might be beneficially applied, as it would coagulate over the tender larvæ and pupæ, and set them fast in the earth. (*Gard. Chron.* 1841, 292.)

In North America the peach constitutes an important part of the general produce, serving both as food for swine, and furnishing by distillation a useful spirit. The ravages committed upon them there by insects are so serious, that premiums have been offered for extirpating them. A species of weevil, perhaps a *Rynchites*, enters the fruit when unripe, probably laying its egg within the stone, and so destroys them. And two kinds of *Zygæna*, by attacking the roots, do a still greater injury to the trees. A *Coccus*, as it should seem from the description, imported about thirty years ago from the Mauritius, or else with the Constantia vine from the Cape of Good Hope, has destroyed nearly nine-tenths of the peach trees in the island of St. Helena, where formerly they were so abundant that, as in North America, the swine were fed with them. Various means have been employed to destroy this plague, but hitherto without success. (*Kirby and Spence*, i. 202.)

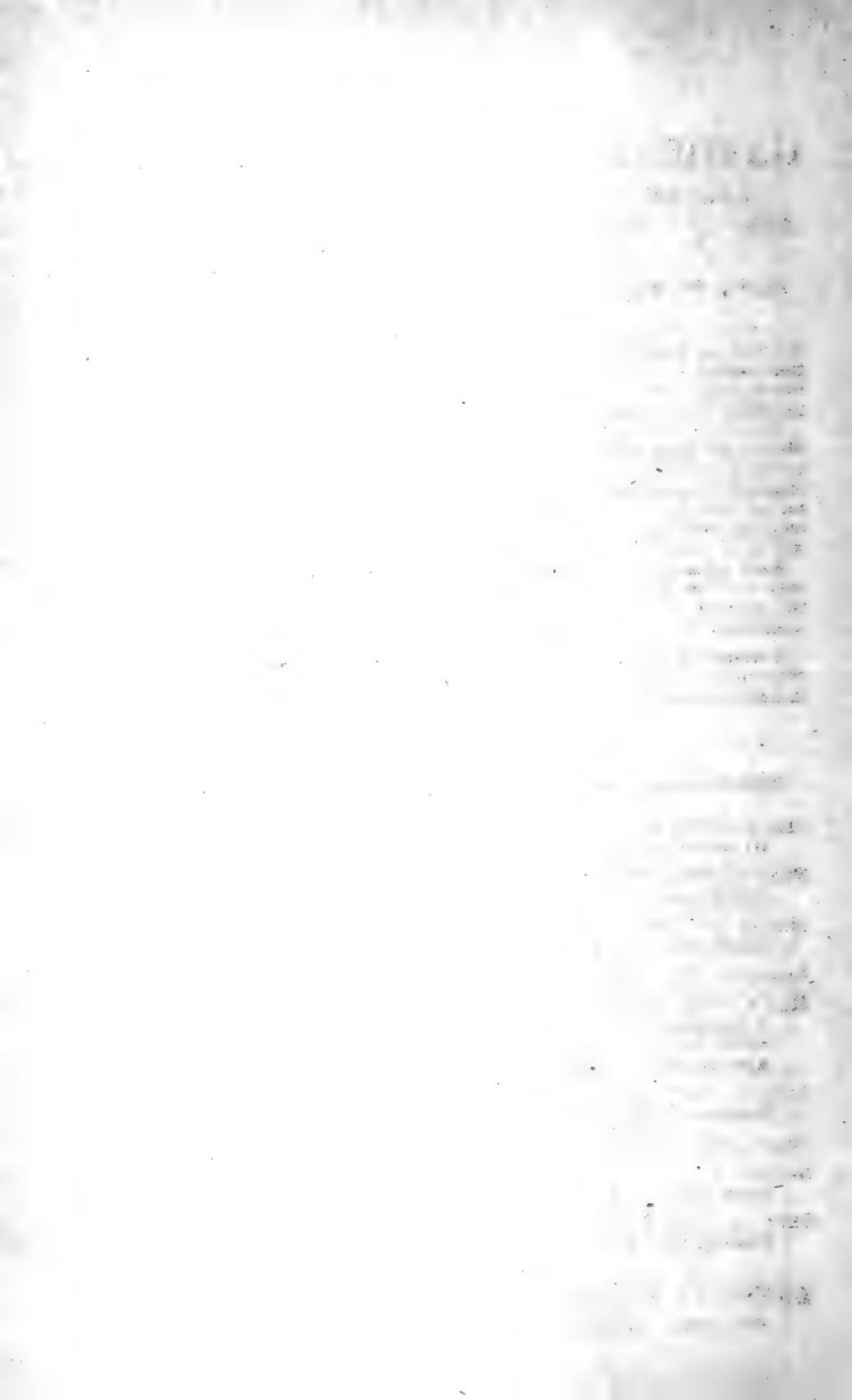
*Wasps* are great ravagers of the fruit of the peach

if from any cause an opening is made through its outer skin. The best prevention is to suspend bottles containing a little beer and sugar near the trees, to lure them from the fruit.

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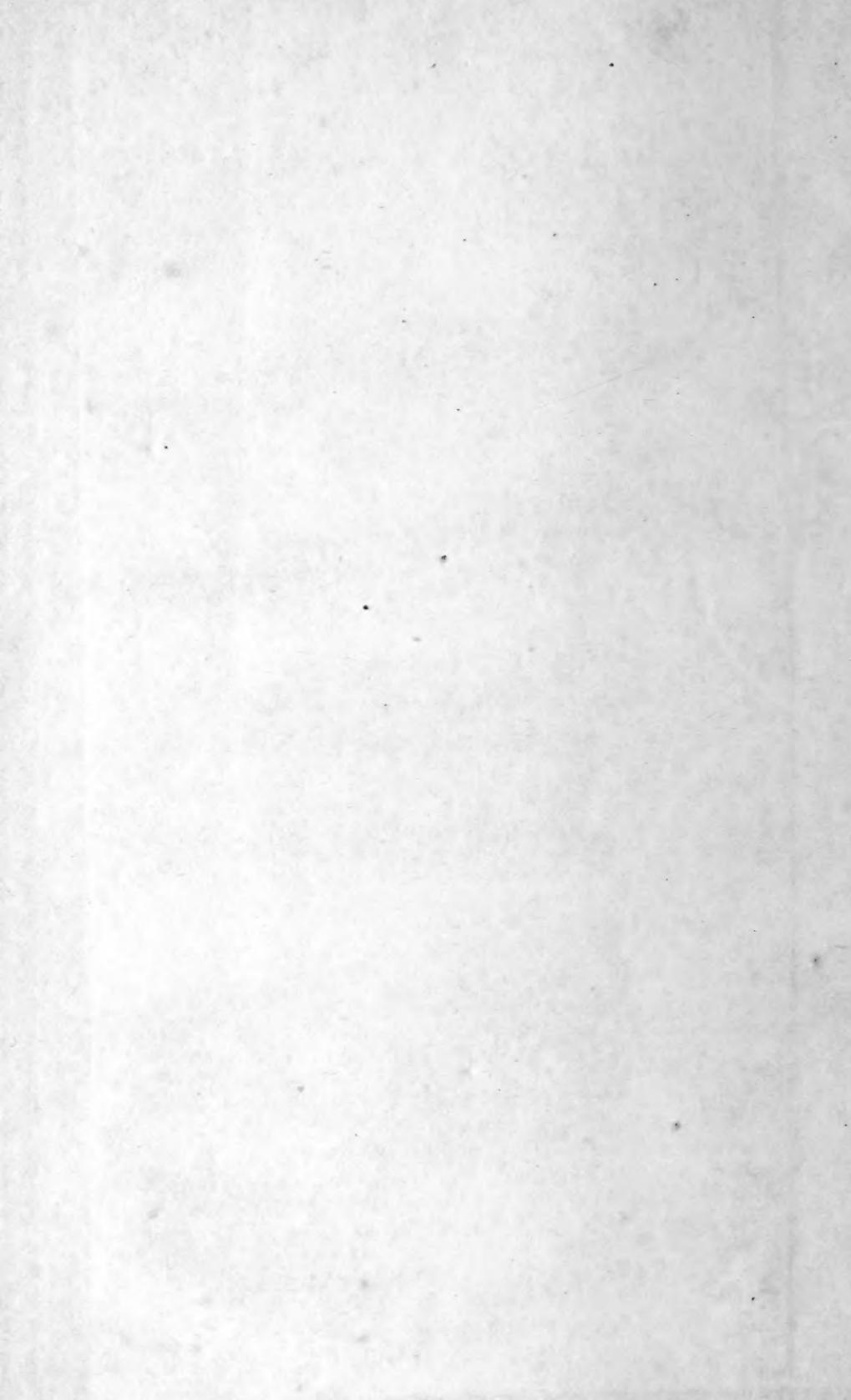
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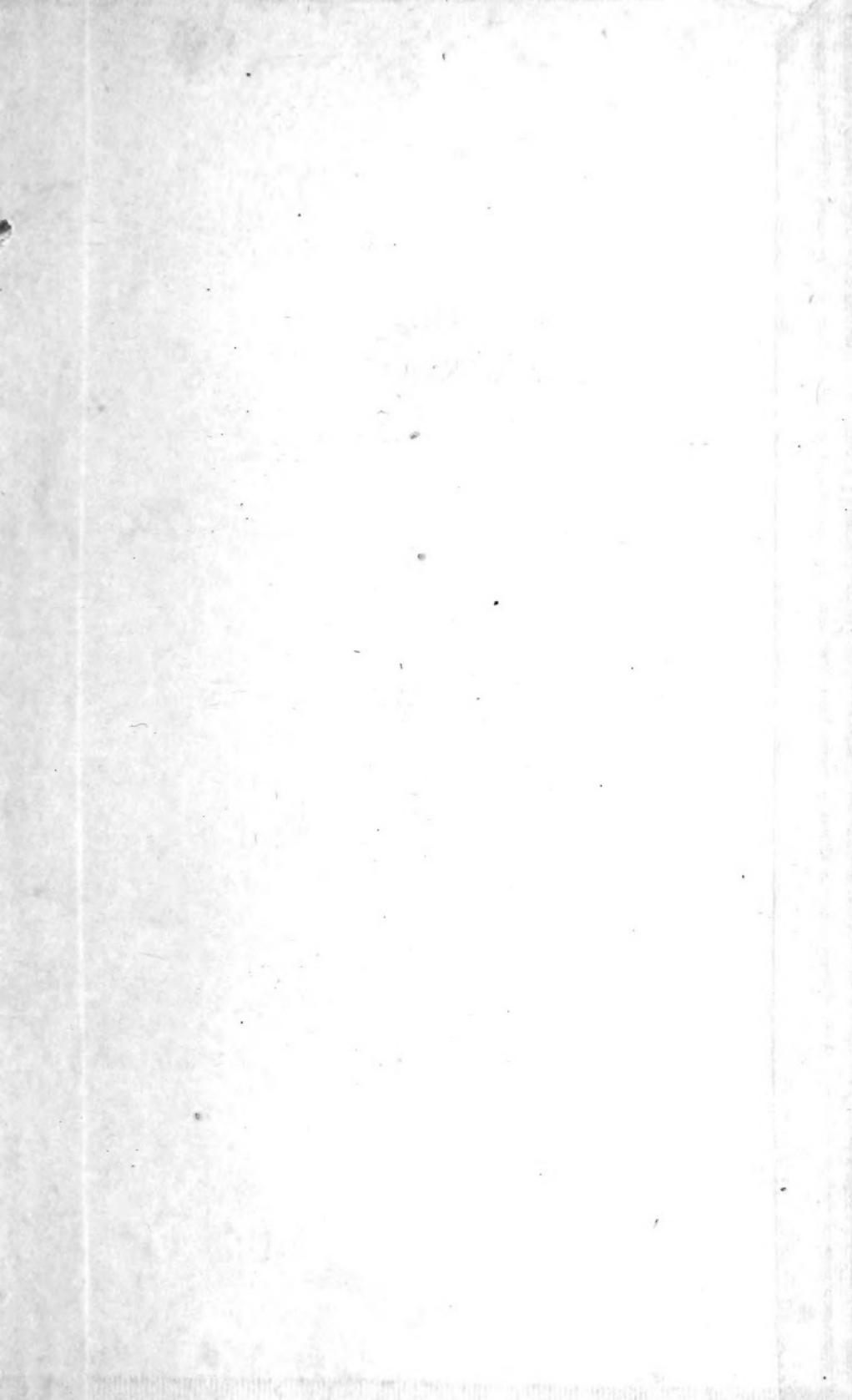
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